A REVISION OF THE FAMILIES DIOSACCIDAE SARS, 1906 AND LAOPHONTIDAE T. SCOTT, 1905 (COPEPODA, HARPACTICOIDA)

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I have recently had an opportunity of studying the collection of Copepoda in the South Australian Museum, a report on which appeared in the previous volume of these Records (Nicholls, 1941).

Arising out of this and some earlier work on a collection of copepods from the St. Lawrence, it has been found necessary to revise the two genera *Amphiascus* and *Laophonte*, and while engaged upon this revision a survey has been made of their respective families. This paper is an attempt to clarify the relationships of the genera comprising these families and, at the same time, to subdivide the two chief genera, both of which contain a large number of species, into homogeneous groups, clearly defined and easily separable. It is hoped that this paper will simplify the process of identification of species belonging to these two genera in particular.

In matters of nomenclature I gratefully acknowledge the assistance received from Professor G. E. Nicholls, of the University of Western Australia, and Mr. K. Sheard, of the South Australian Museum.

It has been necessary to borrow many books of reference from libraries in South Australia, Victoria, and New South Wales. In each case the librarians have been very helpful in sending books required and permitting their retention for several months. A few important works are not available in Australia, notably some of the earlier works of Claus and others.

It is appropriate here to express my thanks to Miss E. Wood, Librarian to the University of Western Australia, for obtaining the large amount of literature required.

Family DIOSACCIDAE Sars 1906.

As Sars (1911, p. 103) has already observed there is a close relationship between the Diosaccidae and Thalestridae. The chief characters distinguishing the two families are as follows:

THALESTRIDAE.	DIOSACCIDAE.
Rostrum usually small and comparatively immobile.	Rostrum large and mobile.
Exopod of first leg usually strongly modified.	Exopod of first leg comparatively unmodified.
Endopod of first leg strongly modified.	Endopod of first leg little modified, except in *Amphiascus* and related genera.
Inner seta on basal segment of first endopod inserted about the middle, or proximal thereto.	Inner seta on basal segment of first endopod always inserted distally.

These two families approach one another most closely in the genera *Dactylopusia* and *Amphiascus*, which have many points in common. Gurney (1927b, p. 512) has already discussed the similarity between them and finds five points of difference. He disposes of the significance, from the systematic aspect, of the number of egg-sacs which was regarded by Sars and Monard as important (see Monard's works, Gurney 1932, p. 17; and Lang 1935a).

The significance of the position of the inner seta on the basal segment of the first endopod is also somewhat questionable. In at least one species of Thalestrid (*Dactylopodella flava* (Claus)) it is inserted beyond the middle of the segment, and in *Robertsonia* (as defined below) which, it is now generally agreed, belongs to the Diosaccidae it tends to become less distal than is usual in typical Diosaccidae. This tendency reaches a climax in *Varnaia monardi* Klie, which I regard as a true *Robertsonia* (see p. 87). Here it approximates to the position it occupies in *Dactylopodella flava*.

The following genera have been ascribed to this family:

Stenhelia Boeck 1864; *Diosaccus* Boeck 1872; *Robertsonia* Brady 1880; *Pseudomesochra* T. Scott 1902; *Parastenhelia* Thompson and Scott 1903; *Amphiascus* Sars 1905a; *Schizopera* Sars 1905a; *Stenheliopsis* Sars 1906; *Pseudodiosaccus* T. Scott 1906; *Tydemanella* A. Scott 1909; *Diosaccopsis* Brian 1925; *Ialysus* Brian 1927; *Amphiascopsis* Gurney 1927b; *Teissierella* Monard 1935; *Varnaia* Klie 1937.

According to Lang (1936a) Sars' genus *Stenheliopsis* is synonymous with *Pseudomesochra* Scott and belongs to the Diosaccidae, while the same author (1934, p. 22) shows that *Parastenhelia* is a Thalestrid and synonymous with *Microthalestris* Sars.

The genus *Tydemanella* was placed by Scott in the Thalestridae but, as has been shown by Lang (1936e, p. 18), it belongs to the Diosaccidae. Brian (1927) described a new genus *Ialysus*, which bears a considerable resemblance to *Tydemanella*, and in a recent paper (1941) I regarded them as synonymous, in order to include a new species from South Australia which was intermediate. I have here separated them once again for reasons given below, and it has thus been necessary to establish a new genus for the Australian species, for which I propose the name *Parialysus* (defined p. 91).

Gurney's genus *Amphiascopsis* has been somewhat modified and enlarged to include a greater number of species, and from the remaining species of *Amphiascus* two new genera have been formed, leaving a small number still regarded as *Amphiascus* sens. str.

Teissierella, stated by Monard to be intermediate between *Amphiascus* and *Robertsonia*, is in fact composed of species belonging to these two genera and therefore lapses.

Varnaia Klie is identical with *Robertsonia*, as defined below.

The family, therefore, consists of the following genera, here arranged in chronological order:

STENHELIA Boeck 1864.

1864. *Stenhelia Boeck.*
1868. *Delavalia* Brady (pro. part.).
1905. *Beatricella* T. Scott 1905a.

DIOSACCUS Boeck 1872.

1863. *Dactylopus* Claus (pro. part.).
1872. *Diosaccus* Boeck.

ROBERTSONIA Brady 1880.

1880. *Robertsonia* Brady.
1894. *Dactylopus* T. Scott (pro. part.).
1902. *Stenhelia* A. Scott (pro. part.).
1903. *Stenhelia* Thompson and Scott (pro. part.).
nec. 1910. *Robertsonia* Brady.
1934. *Amphiascus* Monard.
1935. *Teissierella* Monard.
1935. *Teissierella* Monard 1935a (pro. part.).
1937. *Varnaia* Klie.

PSEUDOMESOCHRA T. Scott 1902.

1902. *Pseudomesochra* T. Scott.
1906. *Stenheliopsis* Sars.

AMPHIASCUS Sars 1905.

1863. *Dactylopus* Claus.
1866. *Dactylopus* Claus.
1868. *Dactylopus* Czerniavski.
1872. *Dactylopus* Boeck.
1872. *Diosaccus* Boeck.
1872. *Stenhelia* Brady.
1875. *Dactylopus* Brady and Robertson.
1880. *Dactylopus* Brady.

1880. *Stenhelia* Brady.
1882. *Dactylopus* Giesbrecht.
1882. *Stenhelia* Giesbrecht.
1893. *Stenhelia* I. C. Thompson.
1894. *Stenhelia* T. Scott.
1894. *Dactylopus* T. Scott 1894a.
1894. *Stenhelia* T. Scott 1894a.
1894. *Stenhelia* T. and A. Scott.
1895. *Stenhelia* T. Scott.
1895. *Stenhelia* T. and A. Scott.
1896. *Stenhelia* A. Scott.
1897. *Stenhelia* T. Scott.
1898. *Dactylopus* T. Scott.
1899. *Dactylopus* Brady.
1899. *Stenhelia* T. Scott.
1900. *Stenhelia* Brady.
1901. *Dactylopus* T. and A. Scott.
1902. *Dactylopus* Giesbrecht.
1902. *Dactylopus* T. Scott.
1902. *Stenhelia* T. Scott.
1902. *Dactylopus* A. Scott.
1902. *Stenhelia* A. Scott.
1903. *Dactylopus* T. Scott.
1903. *Dactylopus* T. Scott 1903a.
1903. *Stenhelia* T. Scott 1903b.
1903. *Dactylopusia* Thompson and Scott.
1903. *Stenhelia* Thompson and Scott.
1905. *Dactylopus* Wolfenden 1905a.
1905. *Dactylopusia* Norman and Scott.
1905. *Stenhelia* Norman and Scott.
1905. *Amphiascus* Sars 1905a.
1935. *Teissierella* Monard.

SCHIZOPERA Sars 1905.

1891. *Dactylopus* Blanchard and Richard.
1905. *Schizopera* Sars 1905a.
1923. *Amphiascus* Klie.
1928. *Amphiascus* Monard 1928a.

PSEUDODIOSACCUS T. Scott 1906.

1893. *Diosaccus* T. and A. Scott 1893a.
1906. *Pseudodiosaccus* T. Scott.

TYDEMANELLA A. Scott 1909.

1909. *Tydemanella* A. Scott.

DIOSACCOPSIS Brian 1925.

1925. *Diosaccopsis* Brian.
1936. *Diosaccopsis* Monard.

IALYSUS Brian 1927.

1927. *Ialysus* Brian.
1927. *Ialysus* Gurney 1927b.
1941. *Tydemanella* Nicholls.

AMPHIASCOPSIS Gurney 1927.

1927. *Amphiascopsis* Gurney 1927b.

To which are added three new genera *Mesamphiascus* (defined p. 79), *Amphiascoides* (defined p. 81), and *Parialysus* (defined p. 91).

SUBDIVISION OF THE DIOSACCIDAE INTO SUBFAMILIES.

Gurney's genus *Amphiascopsis* links on to the Thalestrids by *Dactylopusia* on the one hand, and on the other, following a regular reduction in the number of setae, a series is formed through *Amphiascus* sens. str., *Mesamphiascus* and *Amphiascoides* to *Robertsonia* and *Schizopera*. This group is sufficiently homogenous to constitute a subfamily, here called the Amphiascinae.

The close relationship between *Dactylopusia* and *Amphiascopsis* is further emphasized by the fact that many species described by earlier workers as *Dactylopus(ia)* now find their true position in Gurney's genus, as it has here been modified. Lang (1936e, p. 29) lists 36 species and varieties of *Dactylopus(ia)* which have been wrongly identified, 28 of which, as he points out, belong to *Amphiascus*. Of these 28, two belong to *Robertsonia* or *Schizopera*, two of the varieties are synonyms, seven are placed by me in "*species inquaerendae*" or "not examined" and one in *Amphiascoides*; this leaves 16 species of which 12 belong to *Amphiascopsis* and four to *Amphiascus* sens. str., which in some respects is very close to Gurney's genus.

Of the remaining Diosaccids a second subfamily—the Diosaccinae containing *Diosaccopsis*, *Diosaccus*, *Pseudodiosaccus*, *Tydemanella*, *Ialysus* and *Parialysus* probably arose from *Amphiascopsis*. In these the two inner setae on

the middle segments of the second and third endopods are retained (except in *Parialysus* which shows certain reductions); the long first endopod is prehensile in all, but somewhat shortened in *Tydemanella, Ialysus* and *Parialysus*; a slightly modified first exopod is present in both *Diosaccopsis* and *Pseudodiosaccus*; the inner lobe of the mandible palp is reduced to a seta in *Diosaccus* (except in one species), absent in *Ialysus* and *Parialysus*; and the remaining lobe is further reduced in *Pseudodiosaccus*; the exopod of the second antenna is one-segmented in all but *Pseudodiosaccus*.

The two remaining genera, *Stenhelia* and *Pseudomesochra*, form the third subfamily Stenheliinae. These, with two and one inner setae on the middle segments of the second and third endopods respectively, unmodified first exopod, and relatively long end segment in the first endopod, were probably derived from *Mesamphiascus*. Incidental support for this view is found in the fact that, of the 25 species of *Amphiascus* originally described as *Stenhelia*, 10 belong to *Mesamphiascus*. Of the others, one belongs to *Amphiascus* sens. str., five to *Amphiascoides*, and of the remaining nine, six cannot be placed with certainty though none is excluded from *Mesamphiascus*, and in most cases the probability is in favour of their inclusion in this genus. The last three are those whose descriptions I have not seen.

The name Stenheliinae was first used by Brady (1880, p. 31) for a subfamily of the Family Harpacticidae, and contained the genera *Delavalia, Jonesiella, Ameira*, and *Stenhelia*. This classification has since been superseded by that of Sars, and the name is used here in its restricted sense for *Stenhelia* and closely related genera.

KEY TO THE DIOSACCIDAE.

1. Body without strong demarcation between metasome and urosome .. .. 2.
   (Amphiascinae) subfam. nov.
   Metasome more or less strongly demarcated from urosome .. .. .. 6.
2. Proximal portion of 1st antenna 3-segmented .. .. *Robertsonia* Brady 1880.
   Proximal portion of 1st antenna 4-segmented .. .. 3.
3. End segments of exopods 2–4 with not more than 4 spines and/or setae.
   Schizopera Sars 1905a.
   End segments of exopods 2–4 with more than 4 spines and/or setae .. .. 4.
4. Middle segments of 2nd and 3rd endopods each with 2 inner setae .. .. 5.
   Middle segments of 2nd and 3rd endopods with 2 and 1 inner setae respectively.
   Mesamphiascus gen. nov.
   Middle segments of 2nd and 3rd endopods each with 1 inner seta *Amphiascoides* gen. nov.
5. Middle segment of 1st exopod the largest; basal segment of 1st endopod at least 3 times 2nd and 3rd together and longer than whole exopod; seta formula for inner margins of endopods: 121, 123, 112, of exopods: 112, 113 or 2, 113 or 2 *Amphiascopsis* Gurney 1927b.
   Differing in one or more of these characters .. .. *Amphiascus* sens. str.
6. 1st endopod prehensile; middle segment of 3rd endopod with 2 iner setae; caudal rami little or no longer than wide .. .. .. (Diosaccinae) subfam. nov. 7.
   1st endopod natatory; middle segment of 3rd endopod with 1 inner seta; caudal rami usually at least twice as long as wide .. .. (Stenheliinae) sens. str. 12.
7. 1st endopod 2-segmented .. .. 8.
   1st endopod 3-segmented .. .. 10.
8. Mandible palp biramous .. .. .. *Tydemanella* A. Scott 1909.
   Mandible palp uniramous .. .. 9.
9. Middle segment of 2nd endopod with 2 inner setae; basal segments of exopods 2–4 with inner seta .. .. *Ialysus* Brian 1927.
   Middle segment of 2nd endopod with 1 inner seta; basal segments of exopods 2–4 without inner setae .. .. *Parialysus* gen. nov.
10. 4th endopod 2-segmented .. .. .. *Pseudodiosaccus* T. Scott 1906.
    4th endopod 3-segmented .. .. 11.
11. Basal segment of 2nd antenna divided .. .. .. *Diosaccopsis* Brian 1925.
    Basal segment of 2nd antenna undivided . .. .. *Diosaccus* Boeck 1872.

12. 1st endopod 2-segmented .. .. 13.
1st endopod 3-segmented .. .. .. *Stenhelia* sens. str. Boeck 1864.

13. 1st endoped equal to or longer than exopod; 2nd antenna with 2-segmented exopod (3-segmented in *P. bruceî*); 1st antenna 5- to 7-segmented *Pseudomesochra* T. Scott 1902.
1st endopod equal to or shorter than exopod; 2nd antenna with 3-segmented exopod; 1st antenna 8-segmented .. .. .. *Stenhelia* (*Delavalia*) Brady 1868.

AMPHIASCINAE subfam. nov.

Body elongate, tapering posteriorly, without demarcation between metasome and urosome. First antenna 6- to 9-segmented; 2nd antenna with exopod 2- or 3-segmented; mandible palp biramous, each ramus 1-segmented. Legs 1–4 3-segmented throughout; middle segment of 3rd endopod with 2 or 1 inner setae; caudal rami usually no longer, but much shorter than wide. 6 genera: *Amphiascopsis*, *Amphiascus* sens. str., *Mesamphiascus* (gen. nov.), *Amphiascoides* (gen. nov.), *Robertsonia*, and *Schizopera*.

Genus AMPHIASCUS Sars 1905.

1905. *Amphiascus* Sars 1905a, p. 380; 1906, *Amphiascus* Sars 1911, p. 148.

The genus was defined by Sars (1905a) to contain those species which had been incorrectly ascribed to *Stenhelia* Boeck by Brady and others. He named *Dactylopus longirostris* Claus firstly as an example of his new genus and added that *D. minutus* Claus *and D. debilis* Giesbrecht must also be transferred to his new genus. *Amphiascus longirostris* (Claus) can therefore be established as the type of *Amphiascus* sens. lat. (see p. 77). *A. minutus* (Claus) comes into Gurney's genus *Amphiascopsis*—here somewhat widened—while *A. debilis* (Giesbrecht) comes into the new genus *Amphiascoides*, defined below.

A revision of this genus has been made by Monard (1928a), but he later (1937, p. 32) withdrew his previous work, stating, however, that the basis of his division into groups is natural and could be retained. In his revision (1928a) he extended the seven groups outlined in his 1928 paper to thirteen, and since he also used the setation of the 2nd and 3rd endopods as the chief character for separation into groups, these can be compared with the genera outlined here. His first five groups, correspond to *Amphiascopsis* and *Amphiascus* sens. str. as defined here; the next five are comparable with *Mesamphiascus*, but include also species here regarded as belonging to *Robertsonia*; the remaining three groups correspond to *Amphiascoides*, but include species which belong to *Schizopera*.

The revision attempted here takes *Amphiascopsis* Gurney (1927b) as the starting point, and is based on the setation of the middle segments of the 2nd and 3rd endopods. Where possible, this character is supported by other features. The first and last genera, *Amphiascopsis* and *Amphiascoides*, are clearly defined while, of the other two, *Amphiascus* sens. str. contains those species which are grouped round *A. longirostris* and fall short, in one character or another, from inclusion in *Amphiascopsis*; *Mesamphiascus* is little more than an assemblage of species showing only one common characteristic, but as a whole clearly intermediate between *Amphiascus* sens. str. and *Amphiascoides*.

Broadly defined the new genera are as follows (further details are given below):—

I. *Amphiascopsis* Gurney (modified); and II. *Amphiascus* sens. str. Species with 2 inner setae on the middle segments of the 2nd and 3rd endopods.

III. *Mesamphiascus*. Species with 2 inner setae on the middle segment of the 2nd endopod and 1 inner seta on the middle segment of the 3rd endopod.

IV. *Amphiascoides*. Species with 1 inner seta on the middle segments of both 2nd and 3rd endopods.

ARMATURE OF THE SWIMMING LEGS WITHIN THE GENUS.

As stated above, *Amphiascopsis* is the starting point of a series which links on with *Dactylopusia*. The remaining genera form a natural sequence in which the setation is gradually reduced. *Amphiascus* sens. str. forms a transitional group leading to *Mesamphiascus* but retaining the typical setation of the 2nd and 3rd endopods. *Mesamphiascus*, admittedly a grouping of convenience, is in turn regarded as transitional between *Amphiascus* sens. str. and *Amphiascoides*. The last forms a group as homogeneous as could be expected.

To illustrate the reduction in setation which is observable in the series of genera a summary in tabular form of the total number of "setae" in legs 1–5 is given for each genus. (The term "setae" is used in its widest sense to include spines.) Only 91 out of the total of over 110 species are dealt with in the table, since for the remainder nothing is known about the setation of the 2nd and 3rd legs, and in many of the examples included the information is often incomplete.

The following table shows the distribution of species according to total number of setae and spines on legs 1–5 within the genus *Amphiascus* sens. lat.:

Genus	p.1. exp.		p.2. end.		p.2. exp.		p.3. end.		p.3. exp.		p.4. end.		p.4. exp.		p.5. prox.		p.5. dist.	
	setae	species	setae	species	setae	species	setae	species	setae	species	setae	species	setae	species	setae	species	setae	species
Amphiascopsis	8	25	7	19	11	19	9	18	12	14	8	1	12	14	6	1	7	2
(30 species)	7	4							11	4	7	18	11	3	5	26	6	28
															4	3		
Amphiascus sens. str.	8	11	7	9	11	7	9	7	12	4	7	10	12	6	5	15	6	15
(15 species)	7	4	6	1	10	3	8	2	11	5	6	1	11	3				
							7	1	10	1			10	2				
Mesamphiascus	8	16	7	22	11	7	8	11	11	7	7	12	12	12	5	22	6	18
(26 species)	7	6	6	2	10	11	7	9	10	8	6	11	11	7	4	4	5	8
	6	4			9	2	6	4	9	3	5	1	10	4				
					8	3			8	1			9	2				
Amphiascoides	6	23	6	21	9	6	7	20	9	20	6	22	10	18	5	21	6	7
(23 species)					8	15							9	3	4	2	5	16

It can be seen from this table that there is a gradual reduction in the number of "setae" throughout the series as grouped here. In *Amphiascopsis* 25 of the species have the full number of "setae" on the 1st exopod; of those with only 7, *south-georgiensis* lacks the inner seta on the middle segment and the other 3 lack a "seta" from the terminal segment. In *Amphiascoides*, on the other hand, each of the species has only 6 "setae"—an outer spine on each of the first two segments, and 4 "setae" on the end segment.

A similar trend can be followed in the 2nd and 3rd legs; in the case of the endopods this is partly due to the loss of one inner seta on the middle segments, by which the genera have been defined. But in the 4th leg, only 3 of the 17 species of *Amphiascopsis* for which data are available have less than 12 "setae" on the exopods, whereas in *Amphiascoides*, where our knowledge is fairly complete, none of the 21 species has more than 10. In the endopods of this leg every species of *Amphiascopsis* has 7 "setae" (*fucicolous* apparently 8), while in *Amphiascoides* 6 is the constant figure.

It should further be noted that of the 3 species (*brevis*, *dentatus*, *obscurus*) known to have 7 "setae" on the distal segment of the 5th leg, 2 belong to *Amphiascopsis* (the position of *brevis* is uncertain) and that no species in this genus has less than 6; the majority of those in *Amphiascoides* have only 5. It may be of interest to note that the 6 species with 9-segmented 1st antennae

(Monard's *nasutus*-group) also belong to *Amphiascopsis*, to which may be added *australis* recently described from South Australia.

Amphiascus sens. str. and *Mesamphiascus* are clearly intermediate in reduction in number of setae.

It has been stated above that *Amphiascopsis* appears to be most closely related to *Dactylopusia*, it being suggested that both arose from a common stock in which the middle segments of the endopods in legs 2–4 all had 2 inner setae, a condition which occurs, for instance, in the Tisbidae, and that one of these setae was lost from the 2nd leg in *Dactylopusia* and from the 4th leg in *Amphiascus*. (1)

STRUCTURE OF THE FIFTH LEG WITHIN THE SUBFAMILY.

Those species of *Dactylopusia* with 7 "setae" on the distal segment of the 5th leg (*thisboides* and *micronyx*) have two thin terminal setae, with 2 inner and 3 outer spines; in those with 6 "setae" it is in an inner spine which is lost. The same happens in *Amphiascus*—in *obscurus*, *dentatus*, and *brevis*, the only species known to have 7 "setae" here, the arrangement is as in *Dactylopusia* and in the species with 6 "setae" it is an inner spine which goes, leaving two terminal setae, exserted, with 1 inner and 3 outer spines. The further reduction to 5 "setae" is attained by the loss of an outer spine, as in *varians* (*imus* of Sars, 1906, pl. xcvii).

The very wide basal and distal segments of the 5th leg in *Dactylopusia* are also retained in *Amphiascopsis*. It is interesting to note that the Dactylopusoid shape of the 5th leg is more prominent in those species of *Amphiascopsis* which retain the Dactylopusoid first leg; it occurs in 18 out of the 30 species listed here, the others show a gradual narrowing of the basal segment with elongation of the distal segment, finally reaching the condition found in *hamiltoni*.

In *Amphiascus* sens. str. only 2 species (*pallidus* and *abyssi*) have wide 5th legs, and these species differ from *Amphiascopsis* in the shortening of the middle segment of the exopod and basal segment of the endopod in the first leg, and elongation of the end segments of this endopod. The remaining species in this group of 15 all show an elongation of the distal segment of the 5th leg, culminating in the shape found in *ultimus*, *giesbrechti*, and *pestai*.

A moderately elongate shape is found throughout *Mesamphiascus*, accompanied in some cases by the loss of a spine from the distal segment. This elongation is carried to its extreme in *spinifer*, *normani*, *denticulatus*, and *blanchardi* in which the distal outer spine tends to become modified into a short spur. These species, and the majority of the others in this genus, have an inner seta on the middle segment of the 1st exopod and 5 "setae" on the end segment. Eight species, however, have lost this seta, and while four of these (*bulbifer*, *erythraeus*, *exiguus*, and *simulans*) have also lost a "seta" from the end segment, this is retained by the other four (*amblyops*, *pacificus*, *parvus*, and *sinuatus*). Of the last four, three are difficult to distinguish (*amblyops* differs from the others in having 2 inner setae on the end segment of the 3rd exopod instead of one).

Two species (*junodi* and *mathoi*) retain the inner seta on the middle segment but have lost one of the "setae" from the end segment, and are similar in other respects, while differing from *Mesamphiascus* in general. The four species mentioned above (*bulbifer*, etc.) have a first exopod of the type found in *Amphiascoides*. The 5th leg is of the general type for the genus.

Of the 23 "good" species of *Amphiascoides* listed here only 7 have 6 "setae" on the distal segment of the 5th leg (*clenophorus*, *dictyophorus*, *caudatus*,

(1) Apparently at least one species of *Dactylopusia* still retains the 2 inner setae on the middle segments of the endopods of legs 2, 3 and 4, as seen in *ocellata* Gurney (1927b, p. 505).

ilievecensis, spinulosus, pygmaeus and *rostratus*) and in these the shape is usually that of the type found in *Mesamphiascus* (with the exeeption of *rostratus,* whieh has a subcireular distal segment), and a distribution of setae similar to that of the same genus.

In the remaining species the shape varies from the wide form to an elongate form, most of the species showing an intermediate eondition, wide basally and tapering distally. The "setae", 5 in number on the distal segment, are 2 inner spines, a delicate terminal seta, and 2 outer spines. In some, the 2nd inner spine is less robnst and siuated terminally, as in those forms with 6 "setae." The first arrangement is shown by *debilis* (cf. Sars, 1911, pl. eiv), the second by *subdebilis* Willey (1935, Fig. 49). It is interesting to note that Willey's variety *subdebilis intermixtus* shows the *debilis* arrangement, which occurs in 13 of the species of *Amphiascoides.* This form, which has reeently been found in South Australia, has been raised to specific rank.

In *Robertsonia* the same arrangement of "setae" on the 5th leg is found as in those speeies of *Amphiascoides* and *Mesamphiascus* which have 6 "setae"; in all, the segment is short and wide, without elongation.

Schizopera is interesting in that though the distal segment of the 5th leg may have 5 or 6 "setae" there is only *one* seta definitely terminal in position, showing its derivation from the reduced forms of *Amphiascoides.* I have not made an exhaustive study of the genus, but have examined a dozen speeies in this partieular connection, from among those described by Sars (1909b) and by Gurney (1928).

Comparison of the Males Within the Family.

Support for the classifieation of the Diosaccidae outlined above is obtained from an examination of the males, though as with the females there is a certain amount of overlapping between genera.

Apart from the 1st antenna, the chief modifications in the males are in the basipod of the 1st leg, the endopod of the 2nd leg, and a reduction in the 5th leg. In the 1st leg either the inner spine on the basipod is enlarged or the inner edge of the basipod bears a number of short spurs or spines. Two species, *erythraeus* and *dactylifer,* show a combination of both forms of modification. In some eases there is no modification in the first leg, which is identical with that of the female.

The 2nd endopod is usually only 2-segmented in the males, the 2nd and 3rd segments being fused, but occasionally a 3-segmented endopod occurs as in *pacificus* and *spinulosus.* The endopod in a typieal 2-segmented form, such as *cinctus* or *longirostris,* bears 1 inner seta on the basal segment, and 2 or 3 inner setae, 1 or 2 terminal setae, one of which may be modified into a slender spine, and 2 large outer spines, on the distal segment. Occasionally one of the outer spines is reduced and slender, sometimes occurring as a seta, while in other eases the two large spines appear to be fused into one much wider spine. Of the species with 3-segmented endopods, *pacificus* bears two inner setae on the 2nd segment, and *spinulosus* one, as in their respective females. In the former, the outer spine is elearly borne on the 2nd segment, whereas in *spinulosus* there are two large spines on the outer margin of the end segment. The end segment bears 1 inner and 2 terminal setae in *pacificus* and 1 inner and 1 terminal in *spinulosus.*

The 5th legs are smaller than those of the females, the basal segments of opposite sides are always united in the mid-line, and usually bear 2 spines, occasionally 3. The end segments bear 4–6 "setae" arranged in a manner comparable with those of their respective females. Males are known for 60 species.

In *Amphiascopsis* males have been described for 19 species. Of these the 1st leg has been described in 12 cases, in 8 of which the inner spine on the basipod is enlarged; in the other 4 cases there is no enlargement but a modification of

the inner edge of the basipod. The 2nd endopod has been described in every case, and in 17 of these there are 2 large spines inserted on the outer margin of the fused end segments. In the other two cases the outer appendage is either a weak spine or a seta.

The 5th leg is described in 18 species, in 13 of which 6 "setae" are present, arranged as 2 inner spines, 1 thin terminal seta, and 3 outer spines; in one there are only 5 "setae" and in the other 4 there are only 4 "setae," but in every one of these there is a single thin terminal seta.

In *Amphiascus* sens. str. males are known for 10 of the species. The 1st leg has been described in all but two. Only 2 of these have an enlarged spine, in the other 6 there is a varying number of spurs or spines on the inner edge of the basipod. The 2nd endopod resembles that of the typical *Amphiascopsis* species in every case. The 5th leg has the Amphiascopsid number and arrangement of setae in 6 cases, the other 4 showing a reduction.

In *Mesamphiascus*, in which males are known for 16 species, the 1st leg has been described in only 8 instances. One of these shows the enlarged spine, 6 have the inner edge of the basipod modified, and one (*erythraeus*) shows a combination of both. The 2nd endopod is like that of *Amphiascopsis* in every case but two; in *parvus* there is a small outer spine accompanied by a seta, and *pacificus* has a 3-segmented endopod described above.

The 5th legs normally have 5 "setae," 2 inner spines, 1 thin terminal seta and 2 outer spines; this occurs in 10 species. Four of the remainder show the *Amphiascopsis* condition, and 2 have only 4 "setae," in both there is a single thin terminal seta.

In *Amphiascoides* males are known for 10 species, and the 1st leg has been described in 6 cases. None has the inner spine enlarged, 4 have the inner edge of the basipod with spurs, and 2 are quite unmodified. In those cases where the 1st leg has not been specially mentioned it is probable that it resembles the female, and is therefore unmodified.

The 2nd endopod is described in 10 cases. There is a large terminal spine in 7 of these, 4 of which have an outer spine as well, and the remaining 3 have an outer spine only. The 5th leg, described for 9 species, has the 2.1.2 arrangement of *Mesamphiascus*, except in *ctenophorus* which has 2.1.3.

Summarizing, it can be stated that in *Amphiascopsis*, *cinctus* is typical of the majority; inner spine on 1st basipod enlarged; 2nd endopod with 2 large outer spines inserted about the middle of the end segment and a large terminal spine as well as setae; 5th leg with 2 inner spines, 1 thin terminal seta and 3 outer spines on the distal segment. This condition becomes reduced through the series of genera, with a certain amount of overlapping between genera, to the *debilis* condition in *Amphiascoides*, in which the two end segments have become completely fused and all trace of a middle segment is lost. The end segment is produced into a large spine, and there are 2 inner setae, one of which probably represents a terminal seta.

Males are known for 5 of the species listed under "*Species inquaerendae*".

In *Robertsonia* males are known in every species except *irrasa*, and the sexual modifications are the same in each. The inner margin of the basipod bears a varying number of spur-like projections, but the inner spine is never enlarged. The 2nd endopod, normally 2-segmented but 3-segmented in *propinqua*, according to Sewell (1924) and stated to be 3-segmented in *celtica* (Monard, 1935), but of the usual appearance judging from the figure, bears 1 inner seta on the basal segment, 1 inner seta on the 2nd segment when free, and in a comparable position when fused with the end segment, and on what corresponds to the terminal segment 1 inner seta, 2 terminal setae, one of which may be spine-like, and 2 large outer spines.

The 5th leg shows 6 "setae"; 2 inner spines, 1 thin terminal seta, and 3 outer spines.

In those 5 species of *Schizopera*, of which I have seen descriptions of males, the 1st leg may be modified in either of the two ways described above or may be unmodified. The 2nd endopod shows one constant difference from preceding genera in that there is no inner seta on the basal segment. The 5th leg shows the condition found in *Amphiascoides*, except that the 2 outer spines of the distal segment are usually considerably reduced.

In the Diosaccinae the male of the monotypic *Pseudodiosaccus* is unknown; in *Diosaccus* males are known for *tenuicornis* and *spinatus*. In the first of these the inner edge of the first basipod bears a hook-like spur, and the spine is not enlarged; the second endopod is comparable with the condition in *Amphiascopsis*, but the fused end segments have become greatly reduced in size. In the fifth leg the distribution of setae is not clear, but is comparable with the condition in *A. similis* and *A. minutus*. *D. spinatus* is said to resemble *tenuicornis*, but with fewer setae on the fifth leg.

In *Diosaccopsis ismaelensis* the first basipod does not appear to be modified, the second endopod is three-segmented with two small outer spines on the end segment. The fifth leg is typical of that in *Amphiascopsis*.

Ialysus shows the enlarged spine on the first basipod, but this is not modified in *Parialysus*; the second endopod is two-segmented, with a pair of adjacent spines on the outer edge of the end segment in both genera. The fifth legs lack one inner spine, but the outer spines are well developed, and the thin terminal seta is present.

In general the structure of the males of the Diosaccinae supports the suggested derivation from *Amphiascopsis*.

The suggested derivation of the Stenheliinae from *Amphiascoides* receives strong support from the structure of the males. The first basipod shows no modification, the second endopod is almost exactly as in *A. debilis*, and the setae of the fifth leg are reduced in number.

AMPHIASCOPSIS Gurney 1927b.

The genus is herein defined by the following characters:

1. Middle segment of 2nd and 3rd endopods each with 2 setae.
2. Middle segment of 1st exopod longer than either 1st or 3rd segments, and always with an inner seta(2).
3. Basal segment of 1st endopod longer than whole exopod; 2nd and 3rd segments short, together not more than ½ of basal.
4. Legs 2–4 with the following seta formula for the inner margins:

	Endopod.	Exopod.
p.2.	1.2.1.	1.1.2.
p.3.	1.2.3.	1.1.3 or 2.
p.4.	1.1.2.	1.1.3 or 2.

5. Distal segment of 5th leg with at least 6 setae.

It will be seen that this definition includes all those species transferred by Gurney to this genus, and by extending the somewhat limited definition of his genus a large number of species fall naturally into it. One of the most characteristic features is the second in the above list, which expresses in a slightly altered form that placed first in Gurney's list of distinguishing characters (Gurney, 1927b, p. 515). In many cases where the number of setae on the second and third legs is unknown, species have been placed in this genus on the appearance of the first legs. The group is further characterized by showing little or no reduction from the full number of setae found in *Amphiascus* as a whole.

(2) *A. south-georgiensis* appears to lack the inner seta.

The type species for the genus is *cinctus* (Claus) as described by Sars (1911, p. 149, pl. xci, xcii). It may be inferred from the fact that it heads Gurney's list of species that he also regards this as the type, though he does not state so specifically.

The genus *Amphiascopsis* now contains the following species:

minutus (Claus) 1863; *cinctus* and *similis* (Claus) 1866; **hanseni* (Brady) 1899; **ceylanicus*, **dentatus*, **hamiltoni*, **havelocki*, *hirsutus* and **robustus* (Thompson and Scott) 1903; *maldivensis* (Wolfenden) 1905a; *attenuatus*, *obscurus*, and *phyllopus* (Sars), *nasutus* (Boeck Ms., Sars) 1906; *latifolius* (Sars) 1909a; *thalestroides* (Sars) 1911; **fucicolus* (T. Scott) 1912; *lagunaris* (Grandori) 1925; *aegyptius* and *hirtus* (Gurney) 1927b; *imperator*, *latilobus*, *sexsetatus* and *tenuicaudus* (Monard) 1928; *banyulensis* (Monard) 1928; *monardi* (Lang) 1934; *gracilis* and *south-georgiensis* (Lang) 1936c; *australis* and *longipes* Nicholls 1941.

These species all show the typical structure of the first exopod. (Lang has not illustrated the first leg of *monardi*). Those whose seta formulae are unknown for any of legs 2–4 are marked by an (*). In addition there are a few species in which we do not know the number of setae on the basal segments of these legs (*banyulensis*, *lagunaris*, *sexsetatus*).

Of the above listed species *attenuatus* forms an exception in having the end segments of the first endopod together slightly more than one-third of the basal, and *sexsetatus* in having the middle segment of the first exopod no longer than the basal segment, though clearly longer than the end segment. Both of these species are otherwise good examples of the genus, so far as is known.

It should be noted here that none of the species which definitely come into *Mesamphiascus* and *Amphiascoides* has an enlarged middle segment in the first exopod.

With regard to the synonymy in this genus, *dubius* Jakub. (1933) is undoubtedly a form of *similis* (Claus). As described and figured by Jakubisiak there are minor differences, but as Monard has pointed out (1928, p. 379, fig. 28, 2; and 1935, p. 26) this form shows small variations from the type. There appears to be no real difference, apart from size, between *hirsutus* (Thompson and Scott) and *banyulensis* Monard; but the form described by Monard (1928) as *hirsutus* (Thompson and Scott) differs from *banyulensis* to a greater extent than does the original description.

The species described as *fucicolus* by T. Scott is unusual in that the fourth endopod shows three inner setae on the end segment; the first leg is clearly of the Amphiascopsid type.

For the setation of the legs of *lagunaris* I have relied on Monard (1928a, p. 369), in which it is indicated that this species has the full setation found in *cinctus*. Other details are given by Brian (1928).

Concerning *phyllopus* Sars (1906), Monard (1937, p. 36) states that the end segment of the fourth exopod has seven setae and not eight as stated in his revision, but he later remarks that examples from Banyuls had eight setae. Sars does not illustrate the fourth leg of *phyllopus*, but states that the natatory legs exhibit the full number of setae. If the number can vary between seven and eight, then *monardi* Lang (1934) would appear to be a synonym of *phyllopus* (unfortunately Lang does not illustrate the first leg, but his description shows that it is probably of the Amphiascopsid type); if the number is constant then Monard's specimens from Banyuls (1928) were *phyllopus*, while his Algerian material (1937) would be *monardi*. The illustration of the fifth leg given by Lang agrees well with Sars' figure for *phyllopus*, but the male second endopod appears to differ. The species are probably, therefore, distinct.

While it is tempting to widen the scope of *Amphiascopsis* to include such forms as *catharinae* and *demersus* with their typical first legs, particularly in the former, by admitting forms which lack an inner seta on the basal segments of one or more of the second to fourth exopods, there would then be little reason for ex-

cluding *varicolor*, which differs from these only in lacking one of the inner setae on the end segment of the second endopod; this form leads on to *valens*, with an identical seta formula, but has the end segments of the first endopod together considerably more than one-third of the basal. The division of *Amphiascus* into genera is beset with such problems as this, and Monard (1928a) considers that the genus forms such a natural series that it cannot be divided, even into subgenera. In attempting a division into genera it becomes necessary to draw a line somewhere, however arbitrary.

It should be noted that those species in the above list which have been marked with an (*) may later, when their setation is known, prove to belong not to *Amphiascopsis* but to *Amphiascus* sens. str.

KEY TO AMPHIASCOPSIS FEMALES.

1. End segment of 3rd exopod with 2 inner setae .. .. 2.
   End segment of 3rd exopod with 3 inner setae .. .. 6.
2. End segments of 1st endopod together about 1/3 of basal .. *thalestroides* (Sars) 1911.
   End segments of 1st endopod together no more than 1/4 of basal .. .. .. 3.
3. End segments of 1st endopod together about 1/4 of basal .. *hirtus* (Gurney) 1927b.
   End segments of 1st endopod together no more than 1/6 of basal .. .. .. 4.
4. End segment of 4th exopod with 2 inner setae .. .. *sexsetatus* (Monard) 1928.
   End segment of 4th exopod with 3 inner setae .. .. 5.
5. Distal segment of 5th leg elongate, oval, twice as long as wide .. *tenuiculus* (Monard) 1928.
   Distal segment of 5th leg sub-circular, almost as wide as long .. *gracilis* (Lang) 1936c.
6. End segment of 4th exopod with 2 inner setae .. .. 7.
   End segment of 4th exopod with 3 inner setae .. .. 8.
7. Distal segment of 5th leg elongate, oval, nearly twice as long as wide *similis* (Claus) 1866.
   Distal segment of 5th leg sub-circular, almost as wide as long .. *monardi* (Lang) 1934.
8. 2nd and 3rd segments of 1st endopod fused .. .. *hanseni* (Brady) 1899.
   2nd and 3rd segments of 1st endopod separate .. .. 9.
9. End segment of 4th endopod with 2 inner setae .. .. 10.
   End segment of 4th endopod with 3 inner setae .. .. *fucicolus* (T. Scott) 1912.
10. Exopod of 2nd antenna 2-segmented .. .. 11.
    Exopod of 2nd antenna 3-segmented .. .. 13.
11. End segments of 1st endopod together about 1/3 of basal .. *attenuatus* (Sars) 1906.
    End segments of 1st endopod about 1/5 of basal .. .. 12.
12. Distal segment of 5th leg elongate, rectangular, twice as long as wide.
    hamiltoni (Thompson and Scott) 1903.
    Distal segment of 5th leg oval, half as long again as wide.
    dentatus (Thompson and Scott) 1903.
13. End segments of 1st endopod together about 1/3 of basal .. *australis* Nicholls 1941.
    End segments of 1st endopod together less than 1/3 of basal .. .. .. 14.
14. Middle segment of 1st exopod with inner seta .. .. 15.
    Middle segment of 1st exopod without inner seta .. *south-georgiensis* (Lang) 1936e.
15. End segments of 1st endopod at least 1/4 of basal .. .. 16.
    End segments of 1st endopod no more than 1/5 of basal .. .. 22.
16. Distal segment of 5th leg elongate, twice as long as wide.
    robustus (Thompson and Scott) 1903.
    Distal segment of 5th leg sub-circular, almost as wide as long .. .. .. 17.
17. Basal segment of 5th leg with 4 setae .. *ceylonicus* (Thompson and Scott) 1903.
    Basal segment of 5th leg with 5 setae .. .. 18.
18. Distal segment of 5th leg with 6 setae .. .. 19.
    Distal segment of 5th leg with 7 setae .. .. .. *obscurus* (Sars) 1906.
19. Caudal rami about as long as wide .. .. 20.
    Caudal rami at least twice as wide as long .. .. 21.
20. Basal expansion of 5th leg wide and rounded .. .. *latilobus* (Monard) 1928.
    Basal expansion of 5th leg sub-conical .. .. .. *cinctus* (Claus) 1866.
21. 1st antenna 8-segmented .. .. *imperator* (Monard) 1928.
    1st antenna 9-segmented .. .. .. *maldivensis* (Wolfenden) 1905a.

22. Middle segment of 1st exopod 3 times as long as basal segment *latifolius* (Sars) 1909a.
Middle segment of 1st exopod about twice basal .. .. 23.
Middle segment of 1st exopod not more than half as long again as basal segment .. 26.

23. Distal segment of 5th leg half as long again as wide .. .. 24.
Distal segment of 5th leg almost as wide as long .. .. 25.

24. 1st antenna 8-segmented .. .. *minutus* (Claus) 1863.
1st antenna 9-segmented .. .. .. *nasutus* (Boeck MS., Sars 1906).

25. End segments of 1st endopod together ⅓ of basal .. .. *lagunaris* (Grandori) 1925.
End segments of 1st endopod less than ⅓ basal .. .. *longipes* Nicholls 1941.

26. 1st antenna 8-segmented .. .. 27.
1st antenna 9-segmented .. .. 29.

27. 1st exopod only half of whole endopod .. .. .. *aegyptius* (Gurney) 1927b.
1st exopod almost ⅔ of whole endopod .. .. 28.

28. Distal segment of 5th leg oval .. .. .. *phyllopus* (Sars) 1906.
Distal segment of 5th leg almost square .. .. *havelocki* (Thompson and Scott) 1903.

29. Length 0·5 mm. .. .. *banyulensis* (Monard) 1928.
Length over 1 mm. .. .. .. *hirsutus* (Thompson and Scott) 1903.

AMPHIASCUS sens. str.

This genus, which is very close to *Amphiascopsis*, contains those species which depart from that genus in one or more respects. It can be defined as follows:

1. Middle segments of 2nd and 3rd endopods each with 2 setae;

2. Middle segment of 1st exopod usually not enlarged, but always with an inner seta;

3. Basal segment of 1st endopod usually little or no longer than exopod; 2nd and 3rd segments together usually greater than one-third of basal segment;

4. Legs 2–4 with seta formula usually as in *Amphiascopsis*, but with reduced setation if resembling *Amphiascopsis* in characters 2 and/or 3;

5. Distal segment of 5th leg with at least 6 "setae".

It will be seen that this genus is difficult to define as a whole, and really amounts to a grouping of those species which, while Amphiascopsid in most of their features, depart from the strict definition of that genus in one or more characters.

So far as a type can be selected under such circumstances the specimen described by Sars (1911, p. 159, pl. c, ci) and ascribed by him to *A. longirostris* (Claus) is typical of the majority of the species placed in this genus. It is unfortunate that Claus' description is so meagre that some considerable doubt was expressed by Sars (*loc. cit.* p. 160) as to whether his specimens should really be ascribed to Claus' species.

The following species are included here:

longirostris (Claus) 1863; *abyssi* (Boeck) 1872; *tenuiremis* (Brady and Robertson) 1875; *giesbrechti* and *pallidus* Sars 1906; *catharinae* T. Scott 1906a; *?glacialis* Brady 1910; *varicolor* Farran 1913; *caudaespinosus* Brian 1927a; *valens* Gurney 1927b; *pyrocides* and *ultimus* Monard 1928; *brunneus* Willey 1931; *pestai* Monard 1935; *demersus* Nicholls 1939.

Concerning *glacialis* there is some doubt, since it is almost certain that Brady has figured the second leg, although it is labelled "dritter fuss" (possibly a translator's slip); it may, therefore, belong to *Mesamphiascus*.

The members of this genus all show the two inner setae on the middle segments of the second and third endopods and the inner seta on the middle segment of the first exopod, but differ from *Amphiascopsis* in some other particular, either in the first legs or in having a reduced number of setae on legs 2–4. In this respect they are intermediate between *Amphiascopsis* and *Mesamphiascus*.

Of these species *abyssi*, *giesbrechti*, *pallidus*, *tenuiremis* and *ultimus* have the middle segment of the first exopod as long as the end segment, and *demersus*, *pestai* and *valens* have this segment only very slightly longer than the end segment; in *abyssi*, *pallidus* and *giesbrechti* the first exopod is longer than the basal endopod,

and in these three and the following additional species the end segments of the first endopod are together more than one-third of the basal segment: *glacialis*, *longirostris*, *pestai*, *pyroeides*, *tenuiremis*, *ultimus*, and *valens*. A few, *brunneus*, *catharinae*, *demersus*, *pyroeides* and *varicolor*, while retaining one or both of these Amphiascopsid characters, differ from the members of that genus in the reduction in setation. They, with the exception of *catharinae* and *demersus*, lack one of the "setae" from the end segment of the first exopod, while the same five species, with the possible exception of *pyroeides*, and the addition of *valens*, lack inner setae on the basal segments of the exopods.

Lacking information on the setation of the second and third legs it has not been possible to include *catharinae* in the key. Scott states that in some respects it comes very close to *minutus*, but since it differs from that species in the setation of the fourth exopod it would be unwise to assume no difference in the setation of legs 2 and 3.

Concerning *caudaespinosus*, Brian (1927a) does not illustrate or describe the swimming legs, but Monard (1928a, p. 369) includes it in his *cinctus*-group, and indicates that it has the full setation of the latter form. From Brian's figure of the first leg, however, it is clear that it does not conform to the condition found in *Amphiascopsis*, and must, therefore, be placed in *Amphiascus* sens. str. Assuming it has the *full* setation of *cinctus* it can be seen that it occupies a position intermediate between *pallidus* and *abyssi*, somewhat nearer the former, from which it can be distinguished on the proportions of the first endopod and fifth leg.

KEY TO AMPHIASCUS sens. str. FEMALES.

1. Basal segment of 2nd endopod without seta .. .. *brunneus* Willey 1931.
   Basal segment of 2nd endopod with seta .. .. 2.
2. Basal segment of 2nd exopod without inner setae .. .. 3.
   Basal segment of 2nd exopod with inner seta .. .. 4.
3. 1st exopod half length of whole endopod; end segments of endopod equal.
   varicolor Farran 1913.
   1st exopod ⅔ of whole endopod; end segment longer than middle segment.
   valens Gurney 1927b.
4. End segment of 3rd exopod with 2 inner setae .. .. 5.
   End segment of 3rd exopod with 3 inner setae .. .. 8.
5. End segments of 1st endopod together about ⅓ of basal .. .. .. 6.
   End segments of 1st endopod together no more than ¼ of basal .. .. .. 7.
6. Caudal rami bulbous, hirsute .. .. .. *pestai* Monard 1935.
   Caudal rami normal, rectangular .. .. .. *ultimus* Monard 1928.
7. Basal segments of 3rd and 4th exopods without inner setae .. *demersus* Nicholls 1939.
   Basal segments of 3rd and 4th exopods with inner setae.
   tenuiremis (Brady and Robertson) 1875.
8. 1st exopod longer than basal endopod .. .. 9.
   1st exopod no longer, usually much shorter than basal endopod .. .. .. 12.
9. Distal segment of 5th leg twice as long as wide; caudal seta with pronounced lateral process.
   giesbrechti Sars 1906.
   Distal segment of 5th leg not more than half as long again as wide; caudal setae without processes .. .. 10.
10. End segments of 1st endopod subequal .. .. *caudaespinosus* Brian 1927a.
    End segment of 1st endopod twice as long as middle segment .. .. .. 11.
11. End segments of 1st endopod together equal to basal segment; segments of 1st antenna short and compressed .. .. *abyssi* (Boeck) 1872.
    End segments of 1st endopod together only ⅖ of basal; segments of 1st antenna normal.
    pallidus Sars 1906.
12. Exopod of 2nd antenna 2-segmented .. .. .. *pyroeides* Monard 1928.
    Exopod of 2nd antenna 3-segmented .. .. 13.
13. Caudal rami wider than long .. .. *longirostris* (Claus) 1863.
    Caudal rami longer than wide .. .. *glacialis* Brady 1910.

MESAMPHIASCUS gen. nov.

Amphiascus having two and one inner setae on the middle segments of the second and third endopods respectively.

This group is a somewhat arbitrary collection of species showing considerable range in setation, some species such as *amblyops* having the number of setae approaching that of *Amphiascopsis*, while others show a reduced setation approaching the condition in the next genus. It is, therefore, difficult to select a type species, but perhaps *parvus* Sars (1906, p. 162, pl. ciii) is suitable, occupying a more or less central position in the genus, and having a fairly wide distribution. It has been recorded from the Mediterranean on three occasions, from Bermuda, and from Woods Hole, in addition to the original localities in Norway.

It is of interest to note that all those species having the more unusual shape of fifth leg shown by *denticulatus* are contained in this genus. The following species belong here:

imus (Brady) 1872; *denticulatus* (I. C. Thompson) 1893; *blanchardi* (T. and A. Scott) 1895; *erythraeus* (A. Scott) 1902; *confusus* (T. Scott) 1902; *simulans* and *varians* (Norman and Scott) 1905; *pacificus* (Sars) 1905a; *exiguus, parvus, propinquus, sinuatus, tenellus,* and *typhlops* (Sars) 1906; *amblyops, bulbifer, lagenirostris, normani* and *typhlaides* (Sars) 1911; *spinifer* (Farran) 1913; *angustipes* (Gurney) 1927b; *junodi* (Monard) 1935; *mathoi* and *salammboi* (Monard) 1935a; *gauthieri* (Monard) 1936, ? = *angustipes* (Gurney) 1927b.

Sars (1906) identified a species as *A. imus* (Brady, 1872, 1880), but later (1911, p. 378) decided that his earlier identification was incorrect, and that it should have been recorded as *varians* (Norman and Scott, 1905, 1906) both having been described as distinct species by Norman and Scott. This appears to be correct, but Monard (1928, p. 389) finds no difference between Sars' *propinquus* (1906, p. 158, pl. xcix) and *imus* (Brady). As a matter of fact *propinquus* has a quite different setation in the fourth leg from that shown by Brady for *imus* (1880, pl. xliii), and *propinquus* so far from being a reduced form of *imus*, actually has more setae. The form identified as *imus* (Brady) by Monard is correctly allocated, but *propinquus* (Sars) is distinct, and approaches *varians* (Norman and Scott), from which it can be distinguished by the shape and armature of the fifth legs, proportions of the body, and of the rami of the fourth legs. These may prove to be unimportant, in which case *propinquus* would be a synonym of *varians* (described by Sars in 1906 as *imus*).

Monard (1935, p. 29) states that *sinuatus* (Sars) and *perplexus* (Thompson and Scott) are synonyms, and gives a setae formula for *perplexus* which, as is shown here, agrees with neither *perplexus* nor *sinuatus*. The formulae, so far as they are known and set out in the manner used by Monard for comparison, are as follows:

	sinuatus (Sars) 1906.		*perplexus* (Thompson and Scott) 1903.		*perplexus* (Monard) 1935.	
p.2.	6.	4.2.	—		6.	4.2.
p.3.	6.	6.1.	—		6.	5.1.
p.4.	8.	—	8.	5.1.	8.	4.1.

Thus, while it is clear that Monard is not dealing with *perplexus* (Thompson and Scott) the possibility of *perplexus* being synonymous with *sinuatus* is not excluded by the setae formula. But there are other differences which must be regarded as significant in this genus. The first legs of the two species differ in their proportions, and *perplexus* has an inner seta on the first endopod which is lacking in *sinuatus*; the basal segment of the fifth leg also differs in shape. Monard does not figure his *perplexus* and it is, therefore, uncertain with what species he was dealing, but it is clearly neither of these. As has been seen *perplexus* is inadequately described, and thus cannot with certainty be included in this genus. From Thompson and Scott's description it can be deduced that the natatory legs are

"more or less" as in *imus*, but no importance can be given to this statement since the fourth legs, which are illustrated, are quite distinct from those of *imus*.

Monard (*loc. cit.*, p. 29) also re-establishes the species *tenax* Brian (1927a), regarded by Gurney (1937b, p. 521) as a synonym of *erythraeus* (A. Scott) 1902. The only apparent difference between the two is in the proportions of the distal segment of the fifth leg, which seems insufficient for the separation of a species, and Gurney's view is, therefore, accepted.

For the rest, *falklandiensis* Lang (1936e) is a synonym of *simulans* (Norman and Scott) 1905, 1906; and *sahelensis* Monard 1936 is a synonym of *normani* Sars 1911. This is very clear when one compares the description and figures of *sahelensis* (*loc. cit.*, figs. 4, 5) with Monard's description of *normani* (1928, p. 388, figs. 31, 3, and 32, 1) as well as with Sars (1911, Supp. pl. xix) and Norman and Scott (1906, p. 147, as *Stenhelia longirostris*).

It is doubtful whether *gauthieri* Monard (1936) should be regarded as a distinct species, since the only recorded feature in which it differs from *angustipes* Gurney (1927b) is the arrangement of the setae on the basal segment of the fifth leg.

Teissierella salammboi Monard (1935a) has been included here for the reasons given below (p. 87).

KEY TO MESAMPHIASCUS FEMALES.

1. 2nd endopod without inner seta on basal segment .. .. 2.
   2nd endopod with inner seta on basal segment .. .. 3.
2. 1st antenna 6-segmented; 2nd terminal seta of caudal ramus greatly swollen. *bulbifer* (Sars) 1911.
   1st antenna 8-segmented; caudal setae normal .. .. *junodi* (Monard) 1935.
3. 2nd exopod without inner seta on basal segment .. .. 4.
   2nd exopod with inner seta on basal segment .. .. 7.
4. End segment of 2nd exopod without inner seta .. .. 5.
   End segment of 2nd exopod with 1 inner seta .. .. 6.
   End segment of 2nd exopod with 2 inner setae .. *salammboi* (Monard) 1935a.
5. Distal segment of 5th leg rectangular, with 6 setae .. .. *exiguus* (Sars) 1906.
   Distal segment of 5th leg oval, with 5 setae .. .. *mathoi* (Monard) 1935a.
6. 2nd segment of 1st antenna twice as long as basal segment. *simulans* (Norman and Scott) 1905.
   2nd segment of 1st antenna about equal to 1st .. *erythraeus* (A. Scott) 1902.
7. End segment of 2nd exopod with 1 inner seta .. .. 8.
   End segment of 2nd exopod with 2 inner setae .. .. 17.
8. End segment of 3rd endopod with 2 inner setae .. .. 9.
   End segment of 3rd endopod with 3 inner setae .. .. 12.
9. Middle segment of 4th endopod without inner seta .. .. *typhlops* (Sars) 1906.
   Middle segment of 4th endopod with inner seta .. .. 10.
10. End segment of 4th endopod with 1 inner seta .. .. 11.
    End segment of 4th endopod with 2 inner setae .. *blanchardi* (T. and A. Scott) 1895.
11. Caudal rami straight, inner terminal seta with lateral process .. *typhloides* (Sars) 1911.
    Caudal rami curved, setae normal .. .. .. *confusus* (T. Scott) 1902.
12. End segment of 3rd exopod with 1 inner seta .. .. 13.
    End segment of 3rd exopod with 2 inner setae .. .. *amblyops* (Sars) 1911.
13. End segment of 4th exopod with 2 inner setae .. .. 14.
    End segment of 4th exopod with 3 inner setae .. .. 15.
14. Body segments fringed with spines; basal segment of 5th leg with outer distal process. *spinifer* (Farran) 1913.
    Body segments without spines; 5th leg normal .. .. *lagenirostris* (Sars) 1911.
15. 2nd segment of 1st endopod less than half of end segment; exopod of 2nd antenna with seta on middle segment .. .. 16.
    2nd segment of 1st endopod more than half of end segment; exopod of 2nd antenna without seta on middle segment .. .. *parvus* (Sars) 1906.

16. Rami of 2nd and 3rd legs equal .. .. .. *sinuatus* (Sars) 1906.
Endopods of 2nd and 3rd legs shorter than exopods .. .. *pacificus* (Sars) 1905a.

17. End segment of 3rd endopod with 2 inner setae .. .. 18.
End segment of 3rd endopod with 3 inner setae .. .. 20.

18. 2nd segment of 1st antenna with spur .. .. *denticulatus* (I. C. Thompson) 1893.
2nd segment of 1st antenna without spur .. .. 19.

19. End segments of 3rd and 4th endopods with 2 and 1 inner setae respectively.
normani (Sars) 1911.
End segments of 3rd and 4th endopods with 3 and 2 inner setae respectively.
propinquus (Sars) 1906.

20. End segment of 1st endopod twice as long as 2nd segment .. .. .. 21.
End segment of 1st endopod at least 3 times as long as 2nd segment .. .. 22.

21. Setae on basal segment of 5th leg arranged as a terminal pair, a middle pair and a single proximal seta .. .. *gaulhieri* (Monard) 1936.
Setae on basal segment of 5th leg equidistant .. *angustipes* (Gurney) 1927b.

22. Distal segment of 5th leg with 5 setae .. .. *varians* (Norman and Scott) 1905.
Distal segment of 5th leg with 6 setae .. .. 23.

23. Distal segment of 5th leg, elongate, oval .. .. .. *imus* (Brady) 1872.
Distal segment of 5th leg subrectangular .. .. *tenellus* (Sars) 1906.

AMPHIASCOIDES gen. nov.

The following characters define the genus:

1. Middle segments of 2nd and 3rd endopods each with 1 inner seta;

2. Middle segment of 1st exopod without an inner seta, and segment with only 4 setae and/or spines;

3. Legs 2–4 having basal segments of exopods always without inner seta, and the following seta formula for the margins of the endopods:

p.2.	1.1.1.
p.3.	1.1.2.
p.4.	1.1.1.

The setation of the exopods of these legs is reduced, of the type shown in *hispidus*, and in no case is the number as high as that found in *Amphiascopsis* (see Table, p. 13);

4. The reduction in the number of setae is shown also in the 5th legs in which the distal segment has only 5 setae (with 7 exceptions).

This genus—by virtue of the reduction in the number of setae—clearly forms the connecting link between *Amphiascus* (sens. lat.) and *Schizopera*. The type of the genus is regarded as *debilis* (Giesbrecht) as described by Sars (1911, p. 162, pl. civ).

The following species belong to the genus:

debilis (Giesbrecht) 1882; *intermedius* (T. Scott) 1897; *vararensis* (T. Scott) 1903; *hyperboreus* (T. Scott) 1903b; *neglectus* and *pymaeus* (Norman and Scott) 1905; *hispidus* (Norman MS., Sars) and *nanus* (Sars) 1906; *nanoides* and *spinulosus* (Sars) 1911; *speciosus* (Brian) 1921; *dictydiophorus* (Monard) 1924; *invaginatus* and *sterilis* (Monard) 1926a; *rostratus* (Gurney) 1927b; *commensalis* (Selwell) 1928; *ctenophorus* (Monard) 1928; *ilievecensis* (Monard) 1935; *roberti* (Monard) 1935? = *vararensis* (T. Scott) 1903; *intermixtus* and *subdebilis* (Willey) 1935; *ecaudatus* and *langi* (Monard) 1936.

A. robinsonii, according to Gurney's seta formula (1927b, p. 526) would form an exception in that the fourth endopod appears to have two inner setae on the end segment. However, Willey (1930, p. 107) corrects this slip, and shows that there is only one inner seta here. The species, therefore, complies with the generic description. Gurney (*loc. cit.*) draws attention to the resemblance between this species and *hispidus*, *affinis* (= *vararensis*) and *intermedius*, and enlarges on Scott's original description of *robinsonii*. While the first two can be distinguished from *intermedius*, the distinctions between this and *robinsonii* seem so small that I regard them as synonymous.

According to Monard's figure (1935, fig. 64) the fourth exopod of *roberti* has eight "setae" on the end segment, whereas in the text (p. 35) he states that it has

only seven. The latter is the usual number in this genus, no other species having eight. The species has been given a place in the key on the somewhat dubious assumption that the figure is correct; if the text is correct then the species would appear to be a synonym of *vararensis*.

Klie (1937, p. 24) states that *debiloides* Monard is a synonym of *speciosus* Brian, with which I agree.

The species described as *linearis* by Sars (1906) appears to be identical with *neglectus* (Norman and Scott) 1905, 1906. The size of *linearis* is only 0·63 mm. compared with 0·8 mm. for *neglectus* according to Norman and Scott, but Monard (1935, p. 30) finds *neglectus* only 0·62 mm.; the name *linearis*, therefore, should give way to *neglectus*. Monard (1937, p. 43), however, records the male of *linearis*, so that it is to be presumed that he does not find them to be synonymous. The only possible difference is in the setation of the exopod of the second antenna, but though Norman and Scott's figures differ from Sars' they state that the middle segment is somewhat indistinct, and therefore the seta shown on this segment may possibly occupy the position shown by Sars for *linearis*. The majority of species in this genus lack a seta on the middle segment, or have the exopod only two-segmented.

Stenhelia pygmaea Norman and Scott (1905, 1906), while clearly an *Amphiascus* (sens. lat.), approaches *Robertsonia* in the shape of the first endopod. It belongs to *Amphiascoides*, close to *nanoides* and *hyperboreus*, assuming the second and third exopods lack an inner seta on the basal segment, as does the fourth exopod. I have been unable to find any further reference to this species in the literature, and failing definite information on the second and third legs it cannot be included in the key.

KEY TO AMPHIASCOIDES FEMALES.

1. End segment of 2nd exopod without inner seta .. .. 2.
   End segment of 2nd exopod with inner seta .. .. 16.
2. End segment of 4th exopod with 1 inner seta .. .. 3.
   End segment of 4th exopod with 2 inner setae .. .. 5.
   End segment of 4th exopod with 3 inner setae .. *roberti* (Monard) 1935 (♂).
3. 1st exopod as long as basal endopod; distal segment of 5th leg at least twice as long as wide. *sterilis* (Monard) 1926a.
   1st exopod not more than ⅘ of basal endopod; distal segment of 5th leg less than twice as long as wide .. .. 4.
4. Width of body only ⅕ of length .. .. .. *debilis* (Giesbrecht) 1882.
   Width of body more than ¼ of length .. .. .. *nanus* (Sars) 1906.
5. Basal segment of 1st endopod distinctly longer than exopod .. .. .. 6.
   Basal segment of 1st endopod little or no longer than exopod .. .. .. 8.
6. Basal segment of 5th leg armed only with 5 short spine-like setae *speciosus* (Brian) 1921.
   Basal segment of 5th leg armed with normal setae .. .. 7.
7. Distal segment of 5th leg with 2 terminal setae .. .. *subdebilis* (Willey) 1935.
   Distal segment of 5th leg with 1 terminal seta .. . *intermixtus* (Willey) 1935.
8. 2nd and 3rd segments of 1st endopod together greater than half of basal segment .. 9.
   2nd and 3rd segments of 1st endopod together no more than half of basal segment .. 13.
9. Distal segment of 5th leg elongate, twice as long as wide .. .. .. 10.
   Distal segment of 5th leg short, oval, not more than half as long again as wide .. 12.
10. End segment of 1st endopod twice as long as 2nd segment .. .. .. 11.
    End segment of 1st endopod 3 times as long as 2nd segment .. *nanoides* (Sars) 1911.
11. Basal segment of 1st endopod approximately equal to exopod. *neglectus* (Normau and Scott) 1905.
    Basal segment of 1st endopod only ⅔ of exopod .. *hyperboreus* (T Scott) 1903b.
12. Basal segment of 1st endopod wide proximally, tapering distally; exopod of 2nd antenna 2-segmented .. .. *commensalis* (Seiwell) 1928.
    Basal segment of 1st endopod of same width throughout; exopod of 2nd antenna 3-segmented (♂) .. .. *vararensis* (T. Scott) 1903.

13. Terminal setae of caudal rami greatly swollen basally, tapering abruptly, ending in fine hairs. *langi* (Monard) 1936.
Terminal setae of caudal rami thickened basally but not tapering abruptly .. 14.

14. Greatest width of body less than 1/5 of length .. *hispidus* (Norman MS., Sars 1906).
Greatest width of body more than 1/4 of length .. .. 15.

15. Exopod of 2nd antenna 3-segmented .. .. *intermedius* (T. Scott) 1897.
Exopod of 2nd antenna 2-segmented .. .. *invaginatus* (Monard) 1926a.

16. 1st exopod distinctly shorter than basal endopod; 2nd and 3rd segments of endopod together less than half of basal .. .. 17.
1st exopod very little or no shorter than basal endopod; end segments of endopod together nearly as long as basal .. .. 19.

17. Outer seta of caudal ramus swollen, tapering to a fine hair *dictydiophorus* (Monard) 1924.
Caudal setae normal .. .. 18.

18. Basal segment of 5th leg with 2 long and 3 short setae .. *spinulosus* (Sars) 1911.
Basal segment of 5th leg with 2 long and 2 short setae, one of long setae with large lateral denticles .. .. *illeveensis* (Monard) 1935.

19. Caudal rami very short, about 1/6 or less of anal segment .. .. .. 20.
Caudal rami about 2/5 of anal segment .. .. *clenophorus* (Monard) 1928.

20. Distal segment of 5th leg oval, length to width less than 3 : 2 *rostratus* (Gurney) 1927b.
Distal segment of 5th leg elongate, twice as long as wide *caudatus* (Monard) 1936.

SPECIES INQUAERENDAE.

There remains a number of species whose position cannot be determined with certainty until our knowledge of the second and third legs is complete. These are listed in chronological order:

accraensis (T. Scott) 1894; *dispar* (T. and A. Scott) 1894; *reflexus* (T. Scott) 1895; *herdmani* (A. Scott) 1896; *brucei* (T. and A. Scott) 1901; *brevicornis, dentipes, gracilicaudata, longicornis* and *perplexus* (Thompson and Scott) 1903; *littoralis* and *mixtus* (T. Scott) 1903; *faroensis* (T. Scott) 1903a; *brevis, congener* and *polaris* Sars 1909a; *mucronatus* Brady 1910; *lamellifer* Sars 1911; *proximus* T. Scott 1914; *elegans* and *ignotus* Brady 1918; *similoides* Monard 1928a; *dactylifer* Wilson 1932.

None of the species listed here could belong to *Amphiascopsis*, since this genus is so clearly characterized that even species whose second and third legs are unknown can, with reasonable certainty, be placed therein. The probability with the majority is that they should go into *Mesamphiascus*.

Of *accraensis* Scott states that the swimming legs are "nearly as in *imus*", which suggests that it belongs to *Mesamphiascus*; this is supported by the structure of the first exopod, which excludes it from *Amphiascoides;* it might, however, be included in *Amphiascus* sens. str.

The three species *brevicornis, gracilicaudata* and *longicornis* described as species of *Stenhelia* by Thompson and Scott, are excluded from *Amphiascus* sens. str. by the first exopod or fourth endopod or both, while *dentipes* of the same authors cannot be *Amphiascoides*; *perplexus* of the same authors is probably *Mesamphiascus*.

Of *brevis, congener* and *polaris* Sars states that their natatory legs are normal; these are not illustrated, but *congener* is stated to resemble *similis*, and *polaris* to resemble *imus*. From the drawings of their first exopods it is improbable that they belong to *Amphiascus* sens. str.; they cannot belong to *Amphiascoides* since the middle segment of the first exopod bears an inner seta and the end segment five "setae". Monard (1928a) regards *congener* as a synonym of *faroensis*.

Of *brucei*, the only information concerning the swimming legs is that "second, third and fourth legs similar to *stromi* (Baird)". The illustration of the fourth

(3) As already stated *roberti* is figured with 8 setae on the end segment of the 4th exopod, but described as having 7. If the figure is correct it forms an exception to the rule for the genus, and has been included in the key with that possibility in view; if, as is more probable, the text is correct, then this species is a synonym of *vararensis*.

leg suggests either *Mesemphiascus* or *Amphiascoides*; the first exopod, while typical of *Amphiascoides,* does not exclude it from the former.

Of *dactylifer,* Wilson (1932) states that the legs are of the "usual pattern in this genus". Since the first exopod is without an inner seta on the middle segment, and the end segment has only four "setae", it may belong to either *Mesamphiascus* or *Amphiascoides.*

The first four pairs of legs of *dispar* are stated to resemble those of *imus*; from the first and fourth, which are illustrated, this species could belong to either *Mesamphiascus* or *Amphiascoides.*

Of the two species described by Brady (1918) *ignotus* is known only from the male, while *elegans* is insufficiently described. From the third endopod, which has two inner setae on the middle segment, it would appear to belong to *Amphiascus* sens. str. If so it would be an aberrant form, since the reduced setation of this endopod, lacking outer setae on the end segment, is not found in any other species of *Amphiascus, on any of the endopods.* The description is too unsatisfactory for certain identification.

In the case of *farcensis,* described by T. Scott (1903a) as a variety of *Dactylopus stromi,* the first four pairs of legs are stated to be "almost similar to those of *D. stromi*". This species of *Dactylopus* was renamed by Sars as *vulgaris,* and Scott's variety differs from that in the proportions of the first legs. It appears to be either *Amphiascus* sens. str. or *Mesamphiascus*; it is definitely excluded from *Amphiascoides.*

Of *herdmani* and *similis* A. Scott states that the first four pairs of legs are similar to *imus,* suggesting once more that they belong to *Mesamphiascus*; *similis* is not excluded from *Amphiascoides* however. This species, being distinct from *similis* (Claus) has been renamed *similoides* by Monard (1938a), who places *herdmani* in his *varicolor*-group, and *similoides* in his *giesbrechti*-group, but in each case expresses some doubt. These two groups are among those which correspond to *Amphiascopsis* and *Amphiascus* sens. str., and there seems little justification for their inclusion in either of these genera.

Sars (1911) gives no information about the legs of *lamellifer,* beyond stating its affinities with *confusus, typhloides* and *typhlops,* and since the middle segment of the first exopod has an inner seta and the end segment five "setae", in all probability it belongs with the above species in *Mesamphiascus.*

A. littoralis (T. Scott) 1903, can be either *Mesamphiascus* or *Amphiascoides,* but not *Amphiascus* sens. str., since there is no inner seta on the middle segment of the first exopod, and only four setae on the end segment of the fourth endopod. Monard (1935, p. 31; and 1937, p. 42) identifies a species with *littoralis* (T. Scott) but the setation of Monard's form does not agree with that of Scott in that the end segment of the fourth exopod has seven appendages, whereas Scott's has only six. Further, Monard (1935, fig. 32) shows an inner seta on the middle segment of the first exopod, not present in *littoralis.* Monard's form cannot be identified without further details, but from the single seta present on the middle segments of the endopods, according to his seta formula, it would appear to be an *Amphiascoides,* but the inner seta on the first exopod (*op. cit.,* fig. 32) is not known in any other species of this genus.

Monard (1928a, p. 369) suggests that *mixtus* (T. Scott) is a synonym of *longirostris* (Claus); later (1937, p. 97), however, he identifies a species as *mixtus,* and gives its seta formula, which agrees exactly with that of *longirostris.* He states, also, that the first leg, first antenna and fifth leg agree with Scott's figures. There seems, therefore, no reason for retaining Scott's name, since the only apparent difference is one of size, especially as Scott's figures agree very closely with Sars' for *longirostris.*

The swimming legs of *reflexus* are described by T. Scott (1895) as "somewhat similar to *imus*", and since it is excluded from *Amphiascoides* by the inner seta

on the first exopod, it probably belongs to *Mesamphiascus*, though not excluded from *Amphiascus* sens. str.

The species described by Brady (1910) as *mucronatus* is clearly not an *Amphiascus* but appears to be near to *Ameiropsis* Sars. It is, however, so inadequately described that certain identification is difficult.

Regarding *proximus* T. Scott (1914, p. 373) the description is somewhat inadequate but the appearance of the exopod of the second antenna, which is two-segmented with a very short end segment, and the position of the inner seta on the basal segment of the first endopod suggest affinities with *Ameiropsis* rather than with *Amphiascus*. Unfortunately we know nothing of the swimming legs or rostrum.

The remaining species are those of which I have not seen descriptions:

brevifurcus (Czerniavski) 1868; *limicolus* (Brady) 1900; *crassus* (Giesbricht) 1902; *angrapequensis* Pesta 1916; *rufescens* Brian 1925.

According to Monard (1935a, p. 34) *brevifurcus* (Cz.) is probably synonymous with *debilis* (Giesbrecht); and the same author (1928a, p. 382) states that *rufescens* Brian is known only from the male. In this latter paper he places *crassus* in his *varicolor*-group, which suggests that it belongs to *Amphiascopsis*; it would appear also that it is quite distinct from any other species of *Amphiascus* in having eight setae on the distal segment of the fifth leg. Brady's species *limicolus*, Monard places in his *debilis*-group, which suggests that it belongs to *Amphiascoides*. Of *angrapequensis* he makes no mention; this species is listed in the "Zoological Record", Vol. lv, for 1918.

COLLECTED LIST OF SYNONYMS WITH REFERENCES.

affinis Sars 1906,	= *vararensis* (T. Scott) 1903,	Mon. 1928,
angolensis Monard 1934,	= *Robertsonia*,	
clandestina Klie 1923,	= *Schizopera longicauda* Klie 1925,	Klie 1925,
debiloides Monard 1928,	= *speciosus* Brian 1921,	Klie 1937,
dubius Jakubisiak 1933,	= *similis* (Claus) 1866,	
falklandiensis Lang 1936e	= *simulans* (Norm. and Sc.) 1905,	
irrasus (A. Scott) Monard 1928a,	= *Robertsonia*,	
jugurtha (Bl. and Rich) Monard 1928a,	= *Schizopera*	
knoxi (Th. and Sc.) Monard 1928a	= *Robertsonia*,	
lincaris Sars 1906,	= *neglectus* (Norm. and Sc.) 1905,	
longicaudus Sars Monard 1928a,	= *Schizopera*	
mixtus (T. Scott) 1903,	= *longirostris* (Claus) 1863,	Mon. 1928a,
mucronatus Brady 1910,	= Ameiridae,	
paradoxus Daday Monard 1928a,	= *Schizopera*	
parvulus (Cl.) Brian 1917,	= *Ameira parvula* (Claus) 1866,	Mon. 1928a,
productus Sars 1906,	= *blanchardi* (T. and A. Sc.) 1895a,	Sars 1911,
propinquus (Scott) Monard 1928a,	= *Robertsonia*,	
proximus T. Scott 1914,	= Ameiridae,	
robinsonii (A. Scott) 1902,	= *intermedius* (T. Scott) 1897,	
sahelensis Monard 1936	= *normani* Sars 1911,	
scotti Sewell 1924,	= *Robertsonia propinqua* (T. Sc.) 1894	Gurn. 1927b,
tenax Brian 1927a,	= *erythraeus* (A. Scott) 1902,	Gurn. 1927b,

The following are probably synonyms:

bangulensis Monard 1928,	? = *hirsutus* (Th. and Sc.) 1903,
gauthieri Monard 1936,	? = *angustipes* Gurney 1927b,
roberti Monard 1935,	? = *vararensis* (T. Sc.) 1903.

ROBERTSONIA Brady 1880.

There has been considerable difference of opinion as to whether this genus should be included in the Diosaccidae or Tachidiidae. It has recently been clearly demonstrated by Lang (1935a) that it must be included in the former, as suggested by Gurney (1927b).

The genus is here regarded as being characterized by the following combination of features:

1. 1st antenna 5- to 7-segmented, *having only 3 segments in the basal portion* (4);
2. 2nd antenna with exopod 2- or 3-segmented, but when 3-segmented then the middle segment is without a seta;
3. exopod of 1st leg with an inner seta on the middle segment, and usually with 5 "setae" on the end segment (1 exception, see p. 89);
4. endopods of legs 2–4 with only 1 inner seta on the middle segment;
5. exopods of legs 2–4 without inner seta on the basal segment.

It will be seen that the 4th and 5th characters are those of *Amphiascoides,* the 5th occurring occasionally in *Mesamphiascus;* the 3rd is that of *Amphiascopsis* and the less reduced forms, found also in *Mesamphiascus*; the 2nd is common to all the genera into which *Amphiascus* is here divided, in that the exopod may be 2- or 3-segmented, but the middle segment when present may be with or without a seta, and all three conditions are found in each genus—here, if there is a third segment, the middle one is without a seta. The 1st character, as pointed out by Willey (see footnote) is found only in *Robertsonia.*

This combination of features suggests that *Robertsonia* is derived from *Mesamphiascus,* retaining the unreduced 1st exopod found in that genus, but has undergone a reduction in the setation of legs 2–4, attaining the condition found in *Amphiascoides;* while the 1st antenna has undergone reduction in the number of segments, and the exopod of the 2nd antenna a reduction in the number of setae.

That *Robertsonia* is a distinct genus can be established by an examination of the genital area where it has been figured. That of *tenuis* has been shown by Lang (1935a, p. 6) along with that of *Amphiascus longirostris.* Its relationship to *Amphiascus* is clear, as pointed out by Lang (*loc. cit.*), while its distinctness from *Dactylopusia* is clearly seen by a comparison with the figures for species of this genus given by Lang (1936c, p. 22, figs. 25–28). Other illustrations of the receptacular portion of this apparatus are given by Monard (1926, p. 627) for *diademata* and Willey (1931, pl. xx, figs. 57, 58) for *hamata* and *flavidula.*

A possible exception to the 5th in the above list of generic characters is found in *knoxi* (Thompson & Scott) as described by Gurney (1927b, p. 534), but *diademata* Monard (1926, in 1928, fig. V, 1) which Gurney (*loc. cit.,* p. 530, and 1932, p. 17) regards as a synonym of *knoxi,* lacks the inner seta on the basal segment of at least the 3rd exopod. Monard (1926, p. 627) does not describe or figure the basal segments of the legs of *diademata.*

Amphiascus bulbifer Sars (1911), included by Gurney (1927b, p. 530), in *Robertsonia,* has the basal portion of the 1st antenna with 4 segments, the middle segment of the exopod of the 2nd antenna has a seta, the middle segment of the 1st exopod has an inner seta, and the middle segment of the 2nd endopod has 2 inner setae. In these respects it is a true *Mesamphiascus,* in spite of the 1st legs which, after all, differ very little from those of *exiguus* and *nathoi,* for example.

T. Scott (1894) described a species *Dactylopus propinquus,* which Sewell (1924) transferred to *Amphiascus* and renamed *Scotti,* since it was distinct from *A. propinquus* Sars (1906). As Gurney (1927b, p. 530) has pointed out, Scott's is the older name and should have been retained, but the point does not arise since, as Gurney states, the species really belongs to *Robertsonia.* Sewell points out the resemblance between *propinqua* (T. Scott) and *irrasa* (A. Scott 1902, as *Stenhelia*) which, as far as is known, are separable only on the proportions of the 1st endopod, since the setation of the swimming legs has not been indicated for *propinqua* by either Scott, Sewell, or Gurney. That of *irrasa* is given both by Gurney (*loc. cit.,*

(4) Willey (1931, p. 614) states: "It is one of the leading characters of *Robertsonia* that the proximal portion of the antennule consists in the female of three joints only".

p. 532) and by Monard (1935a, p. 28), but Monard's illustration of the 1st leg (*loc. cit.*, fig. 20) does not agree with those of A. Scott (1902, pl. iii, fig. 8) and Gurney (*loc. cit.*, fig. 146), but agrees closely with those of *propinqua* shown by T. Scott (1894, pl. x, fig. 49) and by Sewell (1924, pl. liv). Thus it would appear that Monard (1935a) was not dealing with *irrasa*, but with *propinqua*, unless these two are forms of the same species, as suggested by Sewell (*loc. cit.*, p. 823). The segmentation of the 1st antenna, according to Sewell, is variable and may be either 5 or 6 in the same species, so that unless there is a difference in the setation of the swimming legs only the long end segment of the 1st endopod distinguishes *irrasa* from *propinqua*. It can, therefore, be assumed that since *irrasa* of Monard (1935a) is in all probability *propinqua*, the seta formula given by Monard is that of the latter.

Amphiascus angolensis Monard (1934) is obviously a species of *Robertsonia*, under the definition given here, and the first leg is identical with that of *propinqua*, but the species differ in the seta formula of the 3rd leg. In *angolensis* there are 4 setae on the end segment of the 3rd endopod, in *propinqua* there are 6, as in *irrasa*.

It should be noted that although T. Scott shows the exopod of the 2nd antenna with a seta on the middle segment in *propinqua* (1894, pl. x, fig. 47), in Sewell's redescription of the species (1924, p. 819, pl. liv) this segment is without setae.

As a result of the inclusion of *Robertsonia* in the Diosaccidae, Monard's genus *Teissierella* (1935, 1935a) breaks down. This genus was created by Monard (1935, p. 24) for the species *T. celtica*, which he regarded as intermediate between *Amphiascus* and *Robertsonia*. Its resemblance to the former depends on the prehensile first leg and double egg-sac, to the latter on the reduced 1st antenna, armed with pectinated setae. Gurney (1927b, p. 532) has stated that these setae may sometimes be absent in *R. knoxi*, and dismisses them as unimportant. *T. celtica* must, therefore, be included in *Robertsonia*—a possibility which is admitted by Monard (1935a, p. 27, footnote)—while *T. salammboi* Monard (1935a, p. 28, figs. 21–30) appears to be a *Mesamphiascus* with somewhat unusual 5th legs.

The inclusion of *salammboi* in the genus *Teissierella* by Monard rested entirely on the pectinated setae of the 1st antenna, which is 8-segmented, with 4 segments in the basal portion. This feature, combined with the presence of 2 inner setae on the middle segment of the 2nd endopod, and inner setae on the basal segments of the 3rd and 4th exopods, clearly shows its affinities with *Amphiascus* and excludes it from *Robertsonia*.

Klie (1937) created a genus *Varnaia*, but did not apparently make a close comparison of this genus with *Robertsonia*. He regards his new genus as intermediate between *Amphiascus* and *Dactylopusia*, in spite of there being only one inner seta on the middle segments of legs 2–4, and later (p. 31) dismisses the setation of the swimming legs from consideration until other species are known. He relates *Varnaia* to *Dactylopusia* on the enlarged basal segment of the 1st endopod, and to *Amphiascus* on the rostrum, 2nd antenna, mandible, maxillule, 5th leg, caudal rami and male features, but separates it from both on the position of the inner seta of the 1st endopod. As pointed out above (p. 66), this is variable in both Thalestrids and Diosaccids, and particularly in *Robertsonia*, in which genus it may even be absent. In fact, *Varnaia monardi* is a good example of *Robertsonia* as defined above and, with the exception of the endopod of the 2nd antenna which Klie states to be indistinctly 3-segmented, all the features named by him as Amphiascoid agree extraordinarily well with Sars' (1911) figures of *R. tenuis*.

In any case, the position of the inner seta on the basal segment of the 1st endopod, unsupported by other distinguishing characters, is insufficient for the creation of a new genus.

Further support for the inclusion of *V. monardi* in *Robertsonia* is found in the 3-segmented basal portion of the first antenna, and the genital area of the female, which shows close agreement with those of *diademata, hamata*, and *flavidula*. In many details Klie's species closely resembles *R. flavidula* Willey (1931), while the reduction in size of the inner seta on the basal segment of the 1st endopod compares with the condition in *R. chesapeakensis* Wilson (1932a) in which it is absent.

The following species have been ascribed to *Robertsonia*:

tenuis Brady 1880; *propinqua* (T. Scott) 1894; *irrasa* (A. Scott) 1902; *knoxi* (Thompson and Scott) 1903; *normani* Brady 1910; *bulbifer* (Sars) 1911; *aculeifera* Klie 1913; *diademata* Monard 1926; *salsa* Gurney 1927a, *flavidula* and *hamata* Willey 1931; *chesapeakensis* Wilson 1932a.

Of these Gurney (1927b, p. 530) has stated that *normani* Brady is an Ectinosomid; *aculeifera* Klie is a synonym of *Thompsonula hyaenae* (I. C. Thompson 1889); and that *diademata* Monard and *salsa* Gurney are synonyms of *knoxi* (Thompson and Scott).

To the genus must be added *angolensis* (Monard) (1934; *celtica* (Monard) 1935; and *monardi* (Klie) 1937. As shown above *bulbifer* belongs to *Mesamphiascus*.

The genus, therefore, comprises the species listed below:

tenuis Brady 1880; *propinqua* (T. Scott) 1894; *irrasa* (A. Scott) 1902; *knoxi* (Thompson and Scott) 1903; *flavidula* and *hamata* Willey 1931; *chesapeakensis* Wilson 1932a, *angolensis* (Monard) 1934; *celtica* (Monard) 1935; *monardi* (Klie) 1937.

KEY TO ROBERTSONIA FEMALES.

1.	End segment of 2nd endopod with 1 inner seta	2.
	End segment of 2nd endopod with 2 inner setae	*celtica* (Monard) 1935.
2.	Segments of 1st endopod subequal	3.
	Basal segment of 1st endopod at least as long as 2nd and 3rd together	4.
3.	Distal segment of 5th leg with 5 setae	*tenuis* Brady 1880.
	Distal segment of 5th leg with 6 setae	*knoxi* (Thompson and Scott) 1903.
4.	End segments of 1st endopod together at least one-quarter of basal segment	5.
	End segments of 1st endopod together no more than one-sixth of basal segment	7.
5.	End segment of 1st endopod twice as long as middle segment	*irrasa* (A. Scott) 1902.
	End segments of 1st endopod subequal	6.
6.	End segment of 3rd endopod with 6 setae	*propinqua* (T. Scott) 1894.
	End segment of 3rd endopod with 4 setae	*angolensis* (Monard) 1934.
7.	1st exopod almost as long as basal segment of endopod	*hamata* Willey 1931.
	1st exopod little more than half of endopod	8.
8.	1st antenna 6-segmented	*monardi* (Klie) 1937.
	1st antenna 7-segmented	*flavidula* Willey 1931.

chesapeakensis Wilson (1932a) cannot be included in the key since the appendages of the female were not described.

SCHIZOPERA Sars 1905.

1905. *Schizopera* Sars, 1905a, p. 383; 1909. *Schizopera* Sars, 1909b, p. 39.

It is not proposed to deal with this genus in detail here since it is confined to fresh or brackish water. Its affinities with *Amphiascus* are very clear, and Monard (1935, p. 21) considers that it should be merged with that genus. This question has been discussed by Gurney (1927b, p. 514; 1932, p. 38) and Chappuis (1931, p. 585). The latter author includes a key to the species.

As stated above, it forms the last genus in the series included in the Amphiascinae, showing the greatest amount of reduction in the number of setae on the swimming legs, and is clearly derived from *Amphiascoides*.

SUMMARY OF DISTINGUISHING CHARACTERS OF THE AMPHIASCINAE.

Character.	*Amphiascopsis*	*Amphiascus* sens. str.	*Mesamphiascus*	*Amphiascoides*	*Robertsonia*	*Schizopera*
1. Number of setae on middle segments of 2nd and 3rd endopods respectively.	2.2.	2.2.	2.1.	1.1.	1.1.	1.1.
2. Middle segment of 1st exopod with inner seta.	yes	yes	yes or no	no	yes	no
3. Middle segment of 1st exopod greater than 1st or 3rd segments.	yes	yes or no	no	no	no	no
4. Number of setae on end segment of 1st exopod.	5	5 or 4	5 or 4	4	5(5)	4
5. End segments of 1st endopod together less than ⅓ of basal.	yes	yes or no	no	no	yes or no	yes or no
6. Number of inner setae on end segment of 3rd endopod.	3	3 or 2	3 or 2	2	3 or 2	1
7. Number of inner setae on end segment of 4th endopod.	2	2	2 or 1	1	2 or 1	1 or 0
8. Basal segments of exopods 2–4 with inner setae.	yes	yes or no	yes or no	no	no(6)	no
9. Number of segments in basal portion of 1st antenna.	4	4	4	4	3	4
10. Middle segment of exopod of 2nd antenna, when present, with seta.	yes or no	yes or no	yes or no	yes or no	no	always 2-segmented

DIOSACCINAE subfam. nov.

Body with metasome enlarged, distinctly wider than urosome and more or less strongly demarcated therefrom. First antenna 8-segmented; exopod of 2nd antenna 1-segmented (2-segmented in *Pseudodiosaccus*); mandible palp uniramous (biramous in *Tydemanella, Diosaccopsis,* and *Diosaccus truncatus*); rami of legs 1–4 usually 3-segmented, but 1st endopod 2-segmented in *Tydemanella, Ialysus* and *Parialysus*; 1st exopod slightly modified in *Diosaccopsis* and *Pseudodiosaccus*; 1st endopod always prehensile; middle segment of 3rd endopod with 2 inner setae; caudal rami little or no longer than wide. 6 genera: *Diosaccopsis, Diosaccus, Pseudodiosaccus, Tydemanella, Ialysus, Parialysus.*

DIOSACCOPSIS Brian 1925.

According to Monard (1936, p. 18), the genus, which was somewhat doubtful as first described by Brian, based as it was on a species (*rubeus*), which closely resembles *Amphiascus pyroeides* Monard 1928, has been firmly established by the inclusion of the species *D. ismaelensis* Monard 1936. 2 species.

D. rubeus Brian 1925, syn. *D. amphiasculus* Brian 1927; and *D. ismaelensis* Monard 1936.

(5) The one exception (referred to on page 86) is *chesapeakensis,* of which only the male appendages have been described.

(6) One exception, *knoxi,* whose seta formula is given by Gurney (1927b).

DIOSACCUS Boeck 1872.

The genus contains 5 species:

tenuicornis (Claus) 1863; *sordidus* Brady 1910; *ruber* Brian 1923; *truncatus* Gurney 1927b; *spinatus* Campbell 1929.

PSEUDODIOSACCUS T. Scott 1906.

This genus was created by T. Scott for the species *Diosaccus propinquus* T. and A. Scott (1893a), and at present contains only the one species.

In a recent paper (1941) I expressed the view that *Ialysus* was synonymous with *Tydemanella*, based chiefly on certain similarities which are evident, and supported by the discovery of a species which appeared to be intermediate between these genera. The finding in Western Australia of further material of the species described from South Australia as *T. robusta* has led me to revise my opinion as to their synonymy.

The result is that the Australian species has now to be placed in a new genus, for which I have (p. 91) suggested the name *Parialysus*, while the other two must be regarded as distinct. This is particularly evident from a comparison of the structure of the mouth parts, which are considerably reduced in *Parialysus*. The distinctive features of the three genera are set out below.

Character	*Tydemanella*	*Ialysus*	*Parialysus*
Ant. Body, depth: length	4: 9	4: 10	4: 7
Urosome, length: width	—	5: 3	almost equal
segments of first antenna	elongate	short and compact	short and compact
mandible palp	biramous	"long slender unbranched rod" (7)	like *Ialysus* but 2-segmented
maxillule, maxilla	"nearly similar to those of *Dactylopodella flava*" (8)	"as in *Dactylopusia*" (7)	strongly reduced and without lobes.
maxilliped	ditto	robust.	like *Ialysus*.
p.1. endopod	length: width — 13: 4 1 terminal spine, and 2 setae.	length: width — 10: 4 2 terminal spines only.	length: width — 14: 4 as in *Ialysus*.
exopod	middle segment with inner seta.	middle segment with inner seta.	middle segment without inner seta.
p.2. endopod	"nearly similar to those of *Dactylopodella flava*" (8)	middle segment with 2 inner setae.	middle segment with 1 inner setae.
exopod		basal segment with inner seta.	basal segment without inner seta.
p.3. endopod		end segment with 3 inner setae.	end segment with 2 inner setae.
exopod		basal segment with inner seta.	basal segment without inner seta.
p.4. exopod		basal segment with inner seta.	basal segment without inner seta.
caudal rami	longer than wide, as long as anal segment.	little longer than wide, shorter than anal sgt.	as wide as long, shorter than anal sgt.

(7) Gurney, 1927b, p. 505.
(8) A. Scott, 1909, p. 217.

TYDEMANELLA A. Scott 1909.

The genus was regarded by Scott as a Thalestrid related to *Dactylopodella*, which it resembles in shape and in the relatively large basal segment of the first endopod. It is, however, as stated by Lang (1936e, p. 18), clearly a Diosaccid.

One species: *T. typica* A. Scott, 1909.

IALYSUS Brian 1927.

Brian placed this genus in the Diosaccidae; Gurney (1927b) discovered the same species independently and regarded it as a Thalestrid, in which view Mouard (1935) supports him. In his revision of the Thalestridae Lang (1936e) confirms Brian's views regarding its systematic position.

One species: *I. rufus* Brian 1927.

PARIALYSUS gen. nov.

The opinion expressed by me (1941) that *Ialysus* is a synonym *of Tydemanella* cannot be upheld, and I am therefore compelled to establish a new genus for the species described as *Tydemanella robusta*, since the mouth parts show a very considerable reduction. Apart from these the species could probably be placed in *Ialysus*, in spite of the much more slender first endopod. The differences have been set out in the table above.

One species: *P. robusta* (Nicholls) 1941.

Subfam. STENHELIINAE sens. str.

Body with metasome enlarged, distinctly wider than urosome and demarcated therefrom. First antenna, 5-, 6-, or 8-segmented; exopod of 2nd antenna 2- or 3-segmented; mandible palp biramous (outer branch strongly developed and reflexed in *Stenhelia*). First exopod unmodified, endopod with long end segment, never prehensile; legs 2–4 with 3-segmented exopods and 2- or 3-segmented endopods; middle segment of 3rd endopod with 1 inner set; caudal rami at least twice as long as wide. 2 genera.

Stenhelia, Pseudomesochra.

STENHELIA Boeck 1864.

The genus is divided into 2 subgenera, according to the segmentation of the 1st endopod. In *Stenhelia* (*Stenhelia*) it is 3-segmented; in *S.* (*Delavalia*) 2-segmented. A key to the genus has been given in an earlier work (1939), from which 3 species were left out. Two of these *S.* (*D.*) *inopinata* (A. Scott) 1902 and *S.* (*D.*) *longifurca* Sewell 1934, were overlooked; *S. ? glacialis* Brady 1918 is insufficiently described, but appears to be a Thalestrid belonging to the subfamily Pseudotachidiinae Lang (1936c); further identification does not seem possible.

The following species referred to *Stenhelia* belong to *Amphiascus*:

ima Brady 1872; *hispida* Norman MS, Brady 1880; *ima* Giesbrecht 1882; *denticulata* I. C. Thompson 1893; *accraensis* T. Scott 1894; *dispar* T. and A. Scott 1894; *reflexa* T. Scott 1895; *blanchardi* T. and A. Scott 1895; *herdmani* and *similis* A. Scott 1896; *intermedia* T. Scott 1897; *limicola* Brady 1900; *confusa* T. Scott 1902; *erythraea* A. Scott 1902; *minuta, perplexa, brevicornis, gracilicaudata, longicornis* and *dentipes* Thompson and Scott 1903; *hyperborea* T. Scott 1903b; *neglecta, pygmaea, simulans, varians* and *longirostris* Norman and Scott 1905.

Of these the following have been renamed: *ima* Giesbreeht = *giesbrechti* Sars; *similis* A. Scott = *similoides* Monard; *minuta* Thompson and Scott = *angustipes* Gurney; *longirostris* Norman and Scott = *normani* Sars.

The following speeies referred to *Stenhelia* now belong to *Robertsonia*:

irrasa A. Scott 1902, *knoxi* Thompson and Scott 1903.

PSEUDOMESOCHRA T. Seott 1902.

This genus has been diseussed by Lang (1936a), who shows that *Stenheliopsis* Sars 1906 is synonymous. A key to the speeies is given by Lang (*loe. eit.*).

LAOPHONTIDAE T. Scott 1905.

1907. *Laophontidae* Sars.

Monard (1935) has diseussed the relationship of the genera included in this family and lists the following genera:

Laophonte Phillippe 1840; *Asellopsis* Brady and Robertson 1873; *Platychelipus* and *Normanella* Brady 1880; *Esola* C. L. Edwards 1891; *Laophontodes* T. Scott 1894a; *Pseudolaophonte* A. Scott; *Laophontina* Norman and Scott 1905; *Harrietella* T. Scott 1906; *Laophontopsis* Sars 1908; *Hemilaophonte* Jakubisiak 1932; *Lobitella* Monard 1934.

The genus *Laophontella* Thompson and Seott (1903, p. 83) was regarded by the authors as a Laophontid, by Gurney (1932, p. 314) and Monard (1935, p. 83) as a Cletodid, but, as has been stated by Lang (1936d, p. 451), is clearly a Cantho-camptid.

The following genera have been added to the family since Monard's review:

Sarsocletodes Wilson 1924 (for *Pseudocletodes* Sars 1921, preoccupied *Coleoptera* 1893 = *Pseudoplatychelipus* Lang 1936), *Cletopsyllus* Willey 1935, *Donsiella* Stephenson 1935.

Of the above genera Sewell 1924, p. 834, considered that *Laophontopsis* Sars 1908 should be known as *Cleta* sinee *lamellifera*, whieh must be regarded as the type, was originally so named by Claus (1863, p. 123); however, *Cleta* is twice preoeeupied (Lepidoptera 1845 and Coleoptera 1850) so that Sars' name stands.

Laophontodes has justly been removed to the family Anehorabolidae by Lang (1936c).

Loaphontina was regarded by Sars (1911, p. 427) as not worthy of generie value and ineluded by him in *Pseudolaophonte*; Monard (1934, p. 3) states that under sueh circumstanees his genus *Lobitella* might well be ineluded in Seott's genus. Monard's genus has, however, the seeond antenna with a reduced exopod, and is here regarded as a distinct genus, as also is *Laophontina*.

Esola, as remarked by Monard (1935, p. 66) appears to be a *Laophonte* with 1-segmented first exopod; it is probable that the four apparent setae on the basal segment of the first endopod are really long hairs, but until the speeies has been redescribed the generie name may be retained.

Aecording to Lang (1936d, p. 451) *Pseudoeletodes* Sars (1921) (preoccupied Coleoptera 1893), is not a Cletodid, and must be transferred to the Laophontidae, close to *Platychelipus*. Lang has renamed Sars' genus as *Pseudoplatyehelipus*, being unaware that Wilson (1924) had already renamed it *Sarsoeletodes*.

As Monard (1935, p. 65) dealing with the genera known at that time, has pointed out, the Laophontidae form a very homogeneous group, with the exception of *Normanella*. Exeluding this genus the family has the following constant features:

1. mandible palp 1-segmented;
2. 1st exopod reduced, without inner setae;

3. 1st endopod with single terminal claw, strongly developed (weak in *Platychelipus*), accessory seta when present very small, no inner seta on end segment, seta on basal segment when present central in position (found only in *Laophontopsis*);

4. rostrum always fused with cephalosome;

5. males, where known, have 3rd endopod 2- or 3-segmented, usually modified; exopods 2–4 modified.

The above characters are constant in all the genera described before Monard's review except *Platychelipus* and *Normanella*. Of these, the former departs so little from these characters that it could be regarded as an aberrant member of the family. *Normanella* on the other hand disagrees with all the above listed features:

1. mandible palp bilobed;

2. 1st exopod of normal development, with inner seta;

3. 1st endopod has distal inner seta on basal segment, inner seta on end segment and long terminal seta in addition to claw;

4. rostrum distinctly defined basally;

5. swimming legs of male undifferentiated from those of female.

This genus, while it has some affinities with the Cletodidae, as exemplified by *Pontopolites*, differs in the first legs to such an extent that it cannot be included in this family. It is probably intermediate between the Cletodidae and Canthocamptidae, and for the present may be relegated to the latter very heterogeneous collection of genera.

Of the genera added since Monard reviewed the family, *Cletopsyllus* departs from the true Laophontid characters in several respects:

1. mandible palp 2-segmented;

2 and 3. 1st legs as in *Normanella*;

4. rostrum defined by suture;

5. (male unknown),

and, therefore, for the present *Cletopsyllus* must accompany *Normanella* into the Canthocamptida.

Unfortunately we know nothing of the mouth parts of *Donsiella*; the shape of the first leg, however, is typical of the Laophontidae, but, there are two subequal terminal claws. The second and third legs have 3-segmented endopods in both sexes, the fourth endopod is 1-segmented in the male and absent in the female; the exopods of the male are like those of the female except for that of the second leg which is slightly modified. It cannot, therefore, remain in this family, where it was placed with some misgivings by its author, and appears to have Tachidiid affinities.

As for *Sarsocletodes*, Lang transfers it to the Laophontidae on account of the structure of the third endopod of the male, which he illustrates on p. 451 (1936d). In my opinion this does not differ from that of *Cletodes limicola*, an accepted Cletodid, to anything like the extent to which *C. limicola* differs from other Cletodids (cf. *Enhydrosoma curticaudatum* in Sars 1911, pl. ccv).

Sarsocletodes differs from the Laophontidae in that the first endopod is shorter than the exopod (a Cletodid character), and is armed with one inner and one terminal seta on the end segment.

The truth probably is that both *Platychelipus*, which departs somewhat from typical Laophontids, and *Sarsocletodes* should be placed in a separate family intermediate between the Laophontidae and Cletodidae. This would leave the Laophontidae a very clearly defined family.

Below is given a diagnosis of the family Laophontidae.

Body usually cylindrical, but flattened and considerably wider in front than behind in *Harrietella*, *Hemilaophonte* and a few species of *Laophonte*; segments defined by lateral incisions; rostrum prominent, always completely fused with the head. Antennules 4- to 8-segmented; antennae 2-segmented, the exopod 1-segmented with four setae, or reduced, even to a single seta; mandible palp always

1-segmented; maxillule usually well developed; maxilla with three inner lobes, the proximal sometimes reduced to a seta; maxilliped prehensile, usually strongly developed.

First legs with endopod always 2-segmented, longer than the exopod, basal segment with or without an inner seta (when present inserted about middle of segment), end segment always without an inner seta but having a single large terminal claw which may be accompanied by a small accessory seta; exopod 2- or 3-segmented, always without inner setae. Legs 2–4 usually with 3-segmented exopods and 2-segmented endopods, both rami reduced in some genera.

Male with third endopod almost always modified, exopods of legs 2–4 usually modified.

The following genera, arranged in chronologieal order, are here regarded as belonging to this family:

LAOPHONTE Philippi.

1840. *Laophonte* Philippi,
1850. *Canthocamptus* Baird (pro part.),
?1860. *Harpacticus* Fischer,
1863. *Cleta* Claus (pro part.),
1866. *Cleta* Claus,
1868. *Cleta* Czerniavski,
1875. *Tetragoniceps* Brady and Robertson (*T. longiremis*),
1907. *Laophonte* Sars (pro part.).

This genus eontains over 100 species which are dealt with in the following pages.

LAOPHONTOPSIS Sars.

1863. *Cleta* Claus,
1908. *Laophontopsis* Sars,
1924. *Cleta* Sewell,
1928. *Laophontopsis* Monard,
1935. *Laophontopsis* Monard,
1935a. *Laophontopsis* Monard.
1937. *Laophontopsis* Monard.

This genus contains two species only: *Laophontopsis lamellifera* (Claus) 1863, and *L. secunda* (Sewell) 1924.

ASELLOPSIS Brady and Robertson.

1873. *Asellopsis* Brady and Robertson,
1895. *Laophonte* T. Scott,
1908. *Asellopsis* Sars.

There are four species known in this genus: *A. hispida* Brady and Robertson 1873; *A. intermedia* (T. Scott) 1895; *A. duboscqui* Monard 1926a; *A. littoralis* Nicholls 1939.

A key to these species has been given by Nicholls (1939).

ESOLA Edwards.

1891. *Esola* C. L. Edwards.

PSEUDOLAOPHONTE A. Scott.

1893. *Laophonte* I. C. Thompson,
1896. *Pseudolaophonte* A. Scott.
1911. *Pseudolaophonte* Sars.

One species: *P. spinosa* (I. C. Thompson) 1893, *syn. P. aculeata* A. Scott 1896.

LAOPHONTINA Norman and Scott.

1905. *Laophontina* Norman and Scott,
1906. *Laophontina* Norman and Scott,
1908. *Pseudolaophonte* Sars.

One species: *L. dubia* Norman and Scott 1905.

HARRIETELLA T. Scott.

1894. *Laophonte* T. Scott, 1894a,
1906. *Harrietella* T. Scott,
1921. *Harrietella* Sars,
?1935. *Laophonte* Stephensen.

One species: *H. simulans* (T. Scott) 1894a. As stated below (p. 98) the specimen described by Stephensen (1935) as probably the male of *Laophonte brevifurca* is much more probably a species of this genus, possibly the male of *H. simulans*.

HEMILAOPHONTE Jakubisiak.

1932. *Hemilaophonte* Jakubisiak.

One species: *H. janinae* Jakubisiak (1932).

LOBITELLA Monard.

1934. *Lobitella* Monard.

One species: *L. apoda* Monard (1934).

ECHINOLAOPHONTE gen. nov.

1876. *Cleta* Norman,
1908. *Laophonte* Sars (pro part.),
1927. *Laophonte* Gurney 1927b (pro part.),
1928. *Laophonte* Brian (pro part.),
1929. *Laophonte* van Douwe (pro part.),
1929. *Laophonte* Brian 1929a.

Laophonte having a single large recurved spur dorsally on the posterior margin of the head segment, and paired spines dorso-laterally on each of the following body segments except the last one or two. Rostrum large and expanded. First antenna 6-segmented, with four segments in the basal portion which is composed of three long segments and a short fourth, bearing the sensory filament; terminal portion with end segment longer than penultimate. First leg with basipod long and slender, its second segment about as long as the basal segment of the endopod; exopod 2-segmented—the two segments may be partially fused—very slender and not exceeding half the length of the basal segment of the endopod. Seta formula for legs 2–4 as follows:

	endopod.	exopod.
p.2.	0.120.	0.1.123 or 2.
p.3.	0.220.	0.1.223.
p.4.	0.120.	0.1.222 or 3.

Fifth leg with basal expansion narrow, with four or five setae, distal segment elongate, bearing only three setae. The above seta formula and this type of fifth leg are found in no other species of *Laophonte* which, together with the modification of the body and rostrum, justifies their removal to a separate genus.

The genus contains the following four species removed from *Laophonte*:

horrida Norman 1876, genotype; *brevispinosa* Sars 1908; *armiger* Gurney 1927b; *mirabilis* Gurney 1927b.

As pointed out below *hystrix* Brian (1928) and *steueri* van Douwe (1929) are synonyms of *armiger* Gurney 1927b.

It is of interest to note that this genus shows affinities with *L.* (*Mesolaophonte*). The seta formula closely resembles that of the *quinquespinosa* group, in at least one member of which body spines are developed. It should be noted, however, that spines are developed also in *dinocerata* which is a *Laophonte* sens. str.

KEY TO THE FEMALES.

1. Basal expansion of 5th leg reaching end of distal segment .. .. .. 2.
   Basal expansion of 5th leg not reaching middle of distal segment *mirabilis* (Gurney) 1927b.
2. 1st endopod at least 3 times as long as exopod .. .. 3.
   1st endopod no more than twice as long as exopod .. .. *brevispinosa* (Sars) 1908.
3. Basal segment of 1st endopod longer than 2nd basipod; rostrum longer than wide. *horrida* (Norman) 1876.
   Basal segment of 1st endopod about equal to 2nd segment of basipod; rostrum wider than long .. .. *armiger* (Gurney) 1927b.

KEY TO THE MALES.

1. 3rd endopod 2-segmented, unmodified, bearing setae only .. *armiger* (Gurney) 1927b.
   3rd endopod 3-segmented, middle segment with spine .. .. .. 2.
2. End segment of 3rd exopod armed with 3 setae and 4 spines .. *brevispinosa* (Sars) 1908.
   End segment of 3rd exopod armed with spines only .. .. *horrida* (Norman) 1876.

The male of *mirabilis* is unknown; that of *armiger* is described by Willey (1930) and by Brian (1928) as *hystrix*

These 10 genera are closely allied and, as already stated, form a well defined family.

Laophonte is here divided into subgenera based on the setation of the swimming legs which, in most cases, show a constant segmentation—the exopod 3-segmented and the endopod 2-segmented. In *L.* (*Metalaophonte*) the fourth endopod is reduced in one or two species, and in the monotypic *L.* (*Neolaophonte*) the endopods of legs 2–4 are all 1-segmented.

The allied genera *Esola*, *Asellopsis*, *Echinolaophonte* and *Laophontopsis* appear to be derivatives of *Laophonte*, in which the body has undergone certain modifications without reduction in the segmentation of the legs. *Esola* differs very little from typical *Laophonte* species and, as stated above, is probably a true *Laophonte*. *Asellopsis* shows the full number of setae found in *Laophonte* sens. str. (see p. 98) but differs in the depressed body and short, lamellar caudal rami, with very short caudal setae. *Echinolaophonte* has the typical seta formula of the *L.* (*Mesolaophonte*) species, but again differs in the structure of the body by the development of a spiny armature and modification of the rostrum. *Laophontopsis* has the setal armature of the *L.* (*Metalaophonte*) species, but differs in the modified caudal rami and presence of an inner seta on the basal segment of the first endopod.

The remaining five genera of this family show a progressive reduction in the segmentation of the legs, and form two series according to whether this reduction proceeds from behind forwards or *vice versa*.

In the *Hemilaophonte* series the reduction starts in the fourth legs and proceeds forwards, as can be seen in the table given below:

	Segmentation of legs.					
	2nd		3rd		4th	
Genus.	exp.	end.	exp.	end.	exp.	end.
Hemilaophonte	3	2	3	2	2	2
Harrietella	3	2	3	2	2	1
Lobitella	3	2	3	1	1	1 (0)

whereas in the *Pseudolaophonte* Series the reduction takes place in the reverse direction:

	Segmentation of legs.					
	2nd		3rd		4th	
Genus.	exp.	end.	exp.	end.	exp.	end.
Pseudolaophonte	1	0	2	2	3	2
Laophontina	1	0	1	0	3	1

From this it is clear that while Sars' view that *Laophontina* should be included in *Pseudolaophonte* might be upheld, the further inclusion of *Lobitella* with these is not justifiable.

KEY TO THE LAOPHONTIDAE.

1. Exopods of legs 2–4 3-segmented .. .. 2.
   At least one of these exopods 1- or 2-segmented .. .. 6.
2. Caudal rami cylindrical, widely separated, armed with at least 1 long seta .. .. 3.
   Caudal rami lamellar, closely approximated, armed only with short spines and/or setae 5.
3. 1st endopod without inner setae on basal segment .. .. 4.
   1st endopod with 4 inner setae on basal segment .. .. *Esola* Edwards 1891.

4. Head with large dorsal spine, rostrum expanded .. .. *Echinolaophonte* gen. nov.
   Head without spine, rostrum normal .. .. .. *Laophonte* Philippi 1840.
5. Caudal rami long and tapering, at least twice as long as anal segment; basal segment of 1st endopod with inner seta .. .. *Laophontopsis* Sars 1908.
   Caudal rami short and rounded, little or no longer than anal segment; basal segment of 1st endopod without inner seta .. .. *Asellopsis* Brady and Robertson 1873.
6. 2nd and 3rd exopods 3-segmented, 4th exopod 1- or 2-segmented .. .. .. 7.
   2nd and 3rd exopods 1- or 2-segmented, 4th exopod 3-segmented .. .. .. 8.
7. 4th exopod 2-segmented, endopod 2-segmented .. *Hemilaophonte* Jakubisiak 1932.
   4th exopod 2-segmented, endopod 1-segmented .. .. *Harrietella* T. Scott 1906.
   4th exopod 1-segmented .. .. *Lobitella* Monard 1934.
8. 3rd and 4th endopods 2-segmented .. .. *Pseudolaophonte* A. Scott 1896.
   3rd endopod absent, 4th endopod 1-segmented .. *Laophontina* Norman and Scott 1905.

LAOPHONTE Philippi 1840.

A diagnosis of the genus has been given by Gurney (1932, p. 314) but needs a minor correction. The third endopod of the male should be described as 2- or 3-segmented.

Monard (1935, p. 66) enumerates 87 species and adds four more in the subsequent pages. To these must be added another 18 species; some of these were omitted from his list, while others have been described since:

mississipensis Herrick 1887; *quinquespinosa* Sewell 1924; *barbata, campbelliensis, tenuispina* and *gurneyi* Lang 1934; *lithophila* Monard 1934; *octavia* Monard 1935a; *corbula, longistylata* and *reticaudata* Willey 1935; *dieuzeidei* Monard 1936; *pauciseta* Lang 1936c; *spelaea* Chappuis 1938; *mendax* Klie 1939; *longiseta* Nicholls 1941; *laurentica* sp.nov.; *arenicola* sp.nov.

Of the species listed by Monard, *hecate* Brehm (1910) is a synonym of *Mesochra lilljeborgi*, according to Gurney (1932, p. 257);

exigua T. Scott (1912) is distinct from *exigua* Sars (1905a), and must therefore be renamed. It is proposed to name it *scotti*;

hystrix Brian (1928), of which *steueri* van Douwe (1929) is a synonym, as has been shown by Brian (1929a), is in turn a synonym of *armiger* Gurney (1927b). Gurney's description was published in 1927, that of Brian in 1928, though references to this paper are usually given as 1927, so Gurney's name has priority. This species is one of those here transferred to the new genus *Echinolaophonte*;

humilis Brian (1929) is a synonym of *mohammed*, according to Gurney (1932, p. 316);

echinata Willey (1930) has been removed by Lang (1936c) to the genus *Laophontodes*, and renamed *armatus*;

rosei Monard (1926) appears to be a synonym of *bulligera* Farran (1913), from which it differs only in the absence of the "sensory organ" described by Farran as present on the fourth endopod, and in the absence of one of the setae on the base of the fifth legs. This seta is inserted near the base of the proximal segment, a portion of which appears to have been lost in *rosei*. However, Dr. Farran in a personal communication informs me that the sensory outgrowth occurred in the same position on the fourth endopods of three individuals. In each case the endopod of one side was lacking, but it is reasonable to assume that the missing endopods were similar to those which were seen. The outgrowth he describes as "very tennous and might escape notice in a mounted specimen". (I have taken the liberty of quoting from his letter.) He stresses the swollen base of the adjoining seta, which Monard also emphasizes (1926, p. 622) and later (1928, p. 418) compares with *bulligera*. In *rosei* the swollen base of the seta is "armée d'un fin chevelu de très fins poils raides et récurrents". No such armature is described for *bulligera*, but the sensory outgrowth is attached at a comparable position.

Unfortunately I have not had access to certain of the literature, and so have not seen descriptions of *parvula* (Claus) 1866, *uncinata* (Czerniavski) 1868,

nordlandica Boeck 1872, and *mississipensis* Herrick 1887; *bafanus* Labbé, listed by Monard without reference, I have been unable to trace.

The specimen described by Stephensen (1935) as probably the male of *Laophonte brevifurca* is, in my opinion, a member of the genus *Harrietella*, and may be the male of *H. simulans*, the only known species, though the rostrum does not appear to be quite so well developed.

L. rhodiaca Brian (1928), known only from the male, may possibly be the male of *L. bulbifera* Norman (1911). The first antenna in both has two spurs on the basal segment, not known in any other species of the genus; the long slender exopod of the second antenna, common to both, is also noticeable; the first legs are very similar, and the fourth legs identical; the caudal rami of *rhodiaca*, though not bulbous, are somewhat modified.

The genus thus comprises about 100 species, somewhat variable amongst themselves, but held together by certain constant characters: the elongate first endopod with no inner seta on the long basal segment, which is followed by a short second segment and a large terminal claw, which may be accompanied by an accessory seta. The exopod of the second antenna is never more than 1-segmented, usually with four setae, though it may be reduced to little more than a knob with two setae, or be absent. The first antenna varies from four to eight in its segmentation, and has either three or four segments in the basal portion; but those species with only three segments in the basal portion cannot be removed as a separate genus, since they show no other feature in common.

The genus can, however, be divided into subgenera on the setation of the endopods of the third legs. Thus the first group, for which the generic name must be retained since it contains the type species, *L. cornuta*, has three inner setae on the end segment of the third endopod. This group, *Laophonte* sens. str., is the largest, and the members show the following general agreement:

1. 2nd endopod with 2 inner, 2 terminal and 0 outer setae on the end segment (except *bulbifera*, *bulligera*, *longicornis*, *rosei* and *typhlops*, which have 2.2.1.; *curticauda*, *nordgaardi* and *reticaudata* which have 1.2.0.);

2. 3rd endopod with 3 inner, 2 terminal and 1 outer setae on end segment;

3. 4th endopod with number of setae on end segment varying from 1.1.1. to 2.2.1., including some forms lacking outer setae.

On the variation in the setation of the fourth endopod and other characters this subgenus can be further divided into groups (see below).

The second subgenus *Laophonte* (*Mesolaophonte*), contains those species in which the third endopod has two inner setae on the end segment.

1. End segment of 2nd endopod has 3 or 4 setae, of which 2 are always terminal. (In *spelaea* there are 5 setae, resembling those species of *Laophonte* sens. str. which have an outer seta on the end segment of this endopod;

2. end segment of 3rd endopod with 2 inner, 2 terminal and 1 outer seta (*quaterspinata* lacks the outer seta);

3. end segment of 4th endopod with 1 inner (2 in *spelaea*), 2 terminal and 0 or 1 outer setae.

Certain species which on the setation of the endopods would fall into this subgenus, but which have developed spines on the body and a modified rostrum, have been transferred to a new genus, *Echinolaophonte*, described above.

The third subgenus, *Laophonte* (*Metalaophonte*), contains those species which show a still further reduction in setation.

1. 2nd endopod with 3 setae on the end segment (4 in *depressa* and *koreni*);

2. 3rd endopod with 3 or 4 setae on the end segment;

3. 4th endopod with not more than 4 setae on the end segment.

The fourth subgenus, *Laophonte* (*Neolaophonte*), has affinities with the preceding subgenus, and contains those species which have their endopods reduced to one segment.

A fifth subgenus, *Laophonte* (*Monolaophonte*), is created for one species, *curvata* van Douwe (1929), also described by Monard (1937) which falls into none of the above subgenera since it has no inner setae on the end segment of the third endopod, and thus shows the greatest reduction in setation.

A number of species remains, which would probably fit into one or other of the subgenera proposed, but cannot as yet be placed with certainty owing to the lack of knowledge of their third legs. These are dealt with below under "*species inquaerendae*".

Keys are given to the females of the different subgenera, but owing to the incomplete state of our knowledge of the males they cannot be assigned to their respective subgenera, and a general key for the males is given.

KEY TO THE SUBGENERA OF LAOPHONTE

(Based on the Females).

1.	Endopods of swimming legs 1-segmented	*L.* (*Neolaophonte*).
	Endopods of at least 2nd and 3rd legs 2-segmented	.. .. 2.
2.	End segment of 3rd endopod with 0 inner seta	*L.* (*Monolaophonte*).
	End segment of 3rd endopod with 1 inner seta	*L.* (*Metalaophonte*).
	End segment of 3rd endopod with 2 inner setae	*L.* (*Mesolaophonte*).
	End segment of 3rd endopod with 3 inner setae	*L.* (*Laophonte*).

LAOPHONTE (LAOPHONTE) sens. str.

As defined above the subgenus contains those species of *Laophonte* with three inner setae on the end segment of the third endopod in the female. *L. cornuta*, though atypical in some respects, is widely distributed and was the first to be described; it is fully described and illustrated by Sars (1911, p. 235, pl. clvii, clviii), and conforms to the subgeneric definition in its setation. It is, therefore, regarded as the type species.

The following species are included in the subgenus:

cornuta Philippi 1840; *stromi* (Baird) 1850; *brevirostris* and *serrata* (Claus) 1863; *curticauda*, *longicaudata* and *thoracica* Boeck 1864; *similis* (Claus) 1866; *minuta* and *elongata* Boeck 1872; *australasica* Thomson 1883; *mohammed* Blanchard and Richard 1891 (9); *longipes* T. Scott 1894; *mainerti* Brady 1899; *perplexa* T. Scott 1899; *inornata* A. Scott 1902 (9); *longiremis* T. Scott 1905; *chathamensis* Sars 1905a; *congenera*, *nana*, *nordgaardi*, *parvula* and *typhlops* Sars 1908; *hyperborea* Sars 1909a; *bulbifera* Norman 1911; *karmensis* Sars 1911; *bulligera* Farran 1913; *tenera* Sars 1921; *dinocerata* and *rosei* Monard 1926; *sporadiensis* Brian 1928; *discophora* Willey 1929; *lunata* Willey 1931; *capillata*, *manifera* and *talipes* (9) Wilson 1932; *barbata*, *campbelliensis*, *gurneyi* and *tenuispina* Lang 1934; *bengalensis* Sewell 1934; *dominicalis*, *parvuloides* and *phycobates* Monard 1935; *octavia* Monard 1935a (9); *reticaudata* Willey 1935; *dieuzeidei* Monard 1936; *laurentica* sp.nov.

This rather large collection of species is divisible into a number of groups, which can be fairly well defined, partly by the number of setae on the fourth endopod.

(9) The inclusion of these species in this subgenus may be open to question. In *talipes* Wilson (1932, p. 264, pl. xiv) there appear to be 6 setae on the 2nd endopod and only 4 on the 3rd. It is assumed here that these legs have been transposed, as Lang (1936d, p. 449) has shown to have been the case for the first two legs of *Quintanus* Wilson (1932); if this is so than *talipes* fits naturally into the subgenus. Similarly it has been assumed that T. Scott (1894) has drawn the 3rd leg of *longipes*, though it is called the 4th; its seta formula agreeing exactly with that of the 3rd endopod in this subgenus. The same is presumed to have happened with *inornata* A. Scott (1902). Apart from these three cases there is only one other apparent case of 6 setae on the end segment of the endopod of any but the *third* leg; in his illustration of the 4th leg of *octavia* Monard (1935a, fig. 76) shows 6 setae, in the text, however (p. 63), it is stated that the 4th endopod has 4 setae. The figure is, therefore, presumed to represent the *third* leg.

1. The *cornuta* group. 1st antenna with segments short and compact mostly with spur on 2nd segment; 5th leg of *cornuta* type, somewhat modified in *dinocerata* and *sporadiensis*, and probably malformed in *laurentica* although very similar to *australasica* which probably comes into this group (see below). To this group belong: *cornuta, dinocerata, dominicalis, laurentica, serrata* and *sporadiensis*.

2. The *typhlops* group. 1st antenna with segments long and slender, 2nd segment without spur; 5th leg of *typhlops* type. Here belong: *barbata, bulbifera, bulligera, elongata, longiremis, rosei, thoracica* and *typhlops*.

3. The *brevirostris* group. 1st antenna with segments neither very compact nor very slender, but with a tendency to form a spur on the 2nd segment; this ranges from the condition in *octavia*, with no trace of a spur, through the bulge seen in *congenera* and *brevirostris* to the well developed recurved hook of *dieuzeidei*. Exopod of the 2nd antenna normal, 5th leg of female as in *brevirostris*, in the male the distal segment is small but distinct.

To this group belong: *brevirostris, congenera, curticauda, dieuzeidei, gurneyi, hyperborea, karmensis, longicaudata, lunata, mcmurrichi, nana, nordgaardi, octavia* (see footnote, p. 99), *perplexa, tenera* and *tenuispina*.

4. The *stromi* group. 1st antenna as in preceding group, but no trace of a spur; exopod of 2nd antenna always reduced; 5th leg of female of *stromi* type, that is having a more or less distinct notch between the 1st and 2nd setae of the distal segment. This feature has already been stressed by Willey (1929, p. 531) and is most marked in *discophora* and least noticeable in *minuta*; 5th leg of male always reduced, the distal segment completely fused with the base.

The group contains: *campbelliensis, discophora, manifera, minuta, phycobates* and *stromi*.

5. The *mohammed* group. These are fresh or brackish water forms. The group comprises *mohammed, chathamensis* and *bengalensis*, which resemble one another in several respects. 1st antenna reduced (3rd and 4th segments fused) but the segments are not compact; exopod of 2nd antenna well developed; male 5th leg reduced (except in *mohammed*); 5th leg of female peculiar—might be derived from *cornuta* type. *L. mississipensis* Herrick 1887, was not mentioned by Monard (1935) and I have not seen the description. It is possible that it belongs to this group as a freshwater form.

6. There remains a number of species which do not fall into any of the above groups, but are intermediate between groups or are distinct. They are:

similis, with a moderately long 1st antenna with a trace of a spur on the 2nd segment, is intermediate between the *typhlops* and *brevirostris* groups, its 5th leg being clearly intermediate between these types;

capillata is intermediate between the *cornuta* and *stromi* groups; the 1st antenna is compact, the exopod of 2nd antenna and male 5th legs are reduced, the female 5th leg is like *dinocerata*;

talipes is intermediate between *brevirostris* and *stromi* groups; 1st antenna not compact, no spur, exopod of 2nd antenna somewhat reduced (2 setae), 5th legs with reduced setae, not unlike *stromi* in structure, male 5th leg with distinct distal segment (see footnote, p. 99);

parvula and *parvuloides* are intermediate between the *cornuta* and *brevirostris* groups, having the 1st antenna not very compact but with a spur, and 5th legs not unlike *dinocerata*. *L. inornata* is also in this intermediate group (see footnote, p. 99).

longipes probably belongs to the *brevirostris* group (see footnote, p. 99), while *reticaudata* is quite distinct from all others in the 1st antenna and 5th legs.

LAOPHONTE (LAOPHONTE) LAURENTICA sp. nov.

Females with the characters of the subgenus, the first exopod 3-segmented, and the first antenna 5-segmented. Males with the third endopod 2-segmented, with the end segment of normal shape bearing a spine on the outer margin. The fourth endopod is 2-segmented without inner setae, while the end segment of the fifth leg is fused with the basal segment.

Occurrence. Two specimens, one of each sex, were washed from *Fucus* growing on rocks in front of the Station at Trois Pistoles P.Q., Canada (Sample No. II).

LAOPHONTE ARENICOLA sp. nov.

Males with the third endopod 3-segmented, basal segment without setae, second segment with a spine only, this extending beyond the end of the ramus. End segment of third endopod with three setae, two inner, one terminal. Second endopod with inner setae normal. Caudal rami twice as long as wide.

Occurrence. A single specimen, a male, was washed from coarse sand at a depth of 8 metres in the St. Lawrence (Sample No. III).

Being known from the male only, this species cannot at present be assigned to a subgenus. It is described here for convenience, and should not be regarded as belonging to *L.* (*Laophonte*) sens. str.

This and the preceding species will be more fully described in "The Annals and Magazine of Natural History", London.

The sample numbers refer to those already published (Nicholls, 1939).

KEY TO FEMALES OF LAOPHONTE SENS. STR.

All the species in this subgenus have 3 inner setae on the 3rd endopod; since the 2nd and 4th legs are not known in many cases the key has, of necessity, been constructed on characters which are regarded as less reliable: segmentation of 1st antenna and 1st exopod.

1. 1st exopod 2-segmented .. .. 2.
   1st exopod 3-segmented .. .. 15.
2. 1st antenna 4-segmented .. .. *cornuta* Philippi 1840.
   1st antenna 5-segmented .. .. 3.
   1st antenna 6-segmented .. .. 5.
   1st antenna 7-segmented .. .. 10.
3. Caudal rami twice as long as anal segment; segments of 5th leg fused. *bengalensis* Sewell 1934.
   Caudal rami no longer than anal segment; segments of 5th leg distinct .. .. 4.
4. End segment of 5th leg not more than twice as long as wide, armed with 3 terminal setae. *mohammed* Bl. and Rich. 1891.
   End segment of 5th leg 3 times as long as wide, with 1 terminal spine and 2 short lateral setae. *chathamensis* Sars 1905a.
5. Basal segment of 4th endopod with inner seta .. .. *bulbifera* Norman 1911.
   Basal segment of 4th endopod without seta .. .. 6.
6. 4th endopod with 2 inner, 2 terminal and 1 outer setae .. .. .. 7.
   4th endopod with 1 inner, 1 terminal and 1 outer seta .. .. .. 8.
7. 2nd inner seta of 4th endopod with basal fringe of fine hairs .. *rosei* Monard 1926.
   2nd inner seta of 4th endopod without fringe, but with sensory outgrowth. *bulligera* Farran 1913.
8. Both segments of 5th legs with only 3 setae .. .. *talipes* Wilson 1932.
   Segments of 5th leg with 4 or 5 setae .. .. 9.
9. End segment of 5th leg not extending beyond basal expansion; caudal rami no longer than anal segment .. .. *nana* Sars 1908.
   End segment of 5th leg extending beyond basal expansion by half its length; caudal rami half as long again as anal segment .. .. .. *similis* (Claus) 1866.
   End segment of 5th leg extending beyond basal expension by ¾ its length; caudal rami nearly 3 times anal segment .. .. *elongata* Boeck 1872.
10. Basal segment of 5th leg with 3 setae .. .. .. *longipes* T. Scott 1894.
    Basal segment of 5th leg with 4 setae .. .. 11.
    Basal segment of 5th leg with 5 setae .. .. .. *phycobates* Monard 1935.
11. End segment of 5th leg with 4 setae .. .. .. *karmensis* Sars 1911.
    End segment of 5th leg with 5 setae .. .. 12.
12. Body with dorso-lateral backwardly projecting lobes .. *lunata* Willey 1931.
    Body without such lobes .. .. 13.
13. Caudal rami not more than twice as long as wide .. .. 14.
    Caudal rami 2½ times as long as wide .. .. .. *hyperborea* Sars 1909a.
14. End segment of 4th exopod with 1 inner seta .. .. *tenera* Sars 1921.
    End segment of 4th exopod with 2 inner setae .. .. *perplexa* T. Scott 1899.
15. 1st antenna 4-segmented .. .. .. *australasica* G. M. Thomson 1883.
    1st antenna 5-segmented .. .. *laurentica* sp.nov.
    1st antenna 6-segmented .. .. 16.
    1st antenna 7-segmented .. .. 23.
    1st antenna 8-segmented .. .. *octavia* Monard 1935a.

16. Each segment of 5th leg with 4 setae .. .. .. *nordgaardi* Sars 1908.
Basal segment with 4 setae, end segment with 5 .. .. 17.
Basal segment with 5 setae, end segment with 6 .. .. 22.

17. Caudal rami no more than twice as long as wide .. .. 18.
Caudal rami more than twice as long as wide .. .. 20.

18. 1st antenna with recurved spur on 2nd segment .. .. *dieuzeidei* Monard 1936.
1st antenna with little or no projection on 2nd segment .. .. .. 19.

19. 4th endopod with 1 terminal seta; 1st endopod with finger-like process distally on basal segment .. .. *capillata* Wilson 1932.
4th endopod with 2 terminal setae; no process on basal segment of 1st endopod. *brevirostris* (Claus) 1863.

20. 1st antenna with rounded protuberance on each side of basal segment; 2nd endopod with 1 inner seta .. .. *reticaudata* Willey 1935.
1st antenna without projections; 2nd endopod with 2 inner setae .. .. 21.

21. End segments of 3rd and 4th exopods with 1 inner seta .. *thoracica* Boeck 1864.
End segments of 3rd and 4th exopods with 2 inner setae .. *barbata* Lang 1934.

22. 1st antenna with spur on 2nd segment .. .. .. *dominicalis* Monard 1935.
1st antenna without spur .. .. *manifera* Wilson 1932.

23. Basal segment of 5th leg with 4 setae .. .. 24.
Basal segment of 5th leg with 5 setae .. .. 27.
Basal segment of 5th leg with 6 setae .. .. .. *longiremis* T. Scott 1905.

24. 1st antenna with spur on 2nd segment .. .. 25.
1st antenna without spur .. .. 26.

25. End segment of 5th leg with 5 subterminal setae .. .. *meinerti* Brady 1899.
End segment of 5th leg with 2 inner and 4 subterminal setae .. *gurneyi* Lang 1934.

26. End segment of 4th exopod with 1.2.2. setae .. .. *curticauda* Boeck 1864.
End segment of 4th exopod with 2.2.3. setae .. .. *congenera* Sars 1908.

27. End segment of 5th leg with 4 setae .. .. .. *sporadiensis* Brian 1928.
End segment of 5th leg with 5 setae .. .. 28.
End segment of 5th leg with 6 setae .. .. 31.

28. 2nd segment of 1st antenna with large triangular projection, bearing setae. *dinocerata* Monard 1926.
1st antenna with little or no spur .. .. 29.

29. Basal segment of 4th endopod with inner seta .. .. 30.
Basal segment of 4th endopod without seta .. .. *inornata* A. Scott 1902.

30. 4th endopod with 2 terminal setae .. .. .. *typhlops* Sars 1908.
4th endopod with 1 terminal seta .. .. .. *longicaudata* Boeck 1864.

31. Exopod of 2nd antenna with only 2 setae .. .. 32.
Exopod of 2nd antenna with 4 setae .. .. 33.

32. Basal segment of 4th exopod swollen, middle segment short, end segment club-shaped. *discophora* Willey 1929.
Segments of 4th exopod of normal shape and proportions .. *minuta* Boeck 1872.

33. 1st antenna with spur on 2nd segment .. .. 34.
1st antenna without spur .. .. 36.

34. End segment of 4th endopod with 1 outer seta .. .. *serrata* (Claus) 1863.
End segment of 4th endopod with no outer seta .. .. 35.

35. End segment of 5th leg at least twice as long as wide .. *parvula* Sars 1908.
End segment of 5th leg about half as long again as wide .. *parvuloides* Monard 1935.

36. 4th exopod without inner seta on end segment .. .. *tenuispina* Lang 1934.
4th exopod with 1 inner seta on end segment .. .. *stromi* (Baird) 1850.
4th exopod with 2 inner setae on end segment .. .. *campbelliensis* Lang 1934.

LAOPHONTE (MESOLAOPHONTE) subgen. nov.

Laophonte species having two inner setae on the third endopod; the type species for this subgenus is *littoralis* T. and A. Scott (1893a), as described by Sars (1908, p. 255, pl. clxxv).

This subgenus can also be divided into groups, the members of which have much in common, based on the setation of the fourth endopod. The following species are included:

littoralis T. and A. Scott 1893a; *exigua* Sars 1905a; *proxima* Sars 1908; *applanata* Sars 1909a; *gracilipes* Brady 1910; *rottenburgi* T. Scott 1912; *quaterspinata* Brian 1917; *abbreviata* Sars 1921; *quinquespinosa* Sewell 1924; *taurina* Monard 1928; *sigmoides* Willey 1931; *lithophila* Monard 1934; *spelaea* Chappius 1938.

1. *spelaea* stands alone, having 5 setae on the end segment of the 4th endopod (2.2.1.).

2. The *exigua* group. With the exception of *taurina*, all have the 1st antenna without spur; the exopod of the 2nd antenna is well developed (except in *littoralis*); the 5th legs are more or less alike, except in *applanata* in which they are elongate; where the males are known all have their 5th legs with distinct distal segment (except *littoralis*).

The following species belong to this group: *abbreviata, applanata, exigua, gracilipes, littoralis, proxima* and *taurina*. These have 4 setae on the 4th endopod (1.2.1).

3. The *quinquespinosa* group. These are alike in having a reduced exopod on the 2nd antenna (only slightly reduced in *quaterspinata*); 5th legs of similar shape (again *quaterspinata* forms an exception); and no spur on 1st antenna. The 5th leg of the male has the distal segment fused with the base except in *quaterspinata*. The group consists of 4 species, perhaps a fifth: *lithophila, quaterspinata, quinquespinosa* and *sigmoides*. Of *rottenburgi*, which possibly belongs here, very little is known; the 1st antenna has a spur, 2nd antenna a reduced exopod, but 2nd and 4th legs are not known. These species have 3 setae on the 4th endopod (1.2.0).

KEY TO FEMALES OF LAOPHONTE (MESOLAOPHONTE).

All the species in this subgenus have 2 inner setae on the 3rd endopod.

1.	2nd and 4th endopods with 2 inner setae	*spelaea* Chappuis 1938.
	2nd and 4th endopods with 2 and 1 inner setae respectively	2.
	2nd and 4th endopods each with 1 inner seta	6.
2.	Basal segment of 5th leg with 2 setae	*quaterspinata* Brian 1917.
	Basal segment of 5th leg with 3 setae	*applanata* Sars 1909a.
	Basal segment of 5th leg with 4 setae	*gracilipes* Brady 1910.
	Basal segment of 5th leg with 5 setae	3.
3.	Exopod of 2nd antenna reduced, with 2 setae	*littoralis* T. and A. Scott 1893a.
	Exopod of 2nd antenna normal	4.
4.	1st antenna with pronounced recurved spur on 2nd segment	*taurina* Monard 1928.
	1st antenna without spur	5.
5.	Greatest width more than 1/3 of total length	*abbreviata* Sars 1921.
	Greatest width no more than 1/4 of total length	*proxima* Sars 1908.
6.	4th endopod with 1 outer seta	*exigua* Sars 1905a.
	4th endopod with no outer seta	7.
7.	End segment of 5th leg with 5 setae	*lithophila* Monard 1934.
	End segment of 5th leg with 6 setae.	*quinquespinosa* Sewell 1924 and *sigmoides* Willey 1931 (10).

LAOPHONTE (METALAOPHONTE) subgen. nov.

Laophonte species having one inner seta on the end segment of the third endopod. The following species are included:

koreni Boeck 1872; *inopinata* T. Scott 1892; *denticornis* and *depressa* T. Scott 1894a; *subsalsa* Brady 1902; *brevifurca* Sars 1921; *baltica* Klie 1929; *kliei* Monard 1935; *longistylata* Willey 1935; *pauciseta* Lang 1936e.

The species included here are alike in the general appearance of the first antenna, but *kliei* has a prominence on the second segment which, in *denticornis* is developed into a large recurved hook; the exopod of the second antenna is normal throughout the group; and the fifth legs of the males, where known, have the distal

(10) These two species are separable only by comparison of the males, and then with difficulty. *L. rottenburgi* has not been included in the key since nothing is known of its 2nd and 4th legs.

segment distinct from the basal, except in *pauciseta*. To this group belong those species which have the endopods of the fourth legs reduced to 1-segment, namely: *inopinata* and *longistylata*, 1-segmented in both sexes, and *koreni*, 1-segmented in male only. In this feature the group leads on to the next subgenus containing those species in which the endopods are 1-segmented in legs 2, 3, and 4.

L. depressa T. Scott 1894a, as described by Sars (1908, p. 239, pl. clx), is selected as the type of the subgenus.

KEY TO THE FEMALES OF LAOPHONTE (METALAOPHONTE).

All the species in this subgenus have only 1 inner seta on the end segment of the 3rd endopod.

1. 4th endopod with 1 inner seta .. .. 2.
   4th endopod without inner seta .. .. .. *longistylata* Willey 1935.
2. 3rd endopod with 2 terminal setae .. .. 3.
   3rd endopod with 1 terminal seta .. .. 9.
3. 3rd endopod with 1 outer seta .. .. 4.
   3rd endopod with no outer seta .. .. 8.
4. 4th endopod with 1 outer seta .. .. 5.
   4th endopod with no outer seta .. .. .. *pauciseta* Lang 1936c.
5. 4th endopod with seta on basal segment .. .. .. *koreni* Boeck 1872.
   4th endopod without seta on basal segment .. .. 6.
6. 3rd endopod with seta on basal segment .. .. .. *depressa* T. Scott 1894a.
   3rd endopod without seta on basal segment .. .. 7.
7. 4th exopod with 5 appendages on end segment .. .. *kliei* Monard 1935.
   4th exopod with 3 appendages on end segment .. .. *subsalsa* Brady 1902.
8. 1st antenna with spur on 2nd segment .. .. .. *denticornis* T. Scott 1894a.
   1st antenna without spur .. .. *baltica* Klie 1929.
9. 2nd endopod with 2 terminal setae .. .. .. *brevifurca* Sars 1921.
   2nd endopod with 1 terminal seta .. .. .. *inopinata* T. Scott 1892.

LAOPHONTE (NEOLAOPHONTE) subgen. nov.

This subgenus contains two species referred to above, *trilobata* Willey (1929) and *corbula* Willey (1935). The endopods of legs 2–4 in these species are 1-segmented, and the setation of these endopods is reduced. *L. (N.) trilobata* Willey (1929, p. 531) is regarded as the type.

KEY TO THE FEMALES OF LAOPHONTE (NEOLAOPHONTE).

1. 2nd, 3rd and 4th endopods with 2 setae .. .. .. *trilobata*.
2. 2nd and 3rd endopods with 3, 4th with 4 setae .. .. .. *corbula*.

The male of *corbula* is unknown, but that of *trilobata* has 1-segmented endopods on legs 2–4, as in the female.

LAOPHONTE (MONOLAOPHONTE) subgen. nov.

Laophonte species without inner seta on end segment of third endopod.

This subgenus contains the single species *curvata* van Douwe (1929). The original description is not very fully illustrated, but further details are given by Monard (1937, p. 67, fig. 5). The exopod of the second antenna is very small, with three setae; endopods of legs 2–4 are 2-segmented with four, three and two setae respectively. The first endopod is unlike that of any other species in having the terminal claw pectinated. According to Monard (*loc. cit.*) the male has the fourth exopod only 2-segmented.

SPECIES INQUAERENDAE.

The species included under this heading are those whose third endopods have not been described. They are:

australasica Thomson 1883; *pilosa* Car 1884; **brevicornis* and *pygmaea* T. Scott 1894; *gracilis* T. Scott 1903; *faroensis* T. Scott 1903a; **hirsuta* Thompson and Scott 1903; *macera* Sars 1908; **glacialis* and *varians* Brady 1910; **australis* and **wiltoni* T. Scott 1912; *insignis* T. Scott 1914; *huntsmani* Willey 1923; *oculata* and *sima* Gurney 1927b; *rhodiaca* Brian 1928; *zimmeri* Van Douwe 1929; **royi* Jakubisiak 1932; *mendax* Klie 1939; **scotti* nom. nov. (*exigua* T. Scott).

The first of these, *australasica*, is almost certainly in the *cornuta* group, with its compact first antenna, well developed exopod of the second antenna, fourth endopod lacking only an outer seta (2.2.0.) and fifth legs like *laurentica*. This species has already been included in *Laophonte* sens. str. (p. 99).

L. faroensis is also probably in *Laophonte* sens. str., with its elongate first antenna, well developed exopod on the second antenna and rather long fifth legs.

L. gracilis with its compact first antenna and fifth legs of the *cornuta* type probably belongs to that group of *Laophonte* sens. str.

Of *huntsmani* Willey states that it is near to *nana* and *nordgaardi*, which would place it also in *Laophonte* sens. str.

L. insignis, with its first antenna neither elongate nor compact, second antenna with reduced exopod, fifth leg not unlike that of *stromi* in shape but lacking the distinctive notch, is probably like *talipes*, intermediate between *stromi* and *brevirostris*.

Of *macera* the swimming legs are stated by Sars to be of "normal structure"; it was placed by him between *perplexa* and *nordgaardi*, and probably belongs to *Laophonte* sens. str.

In the case of *oculata* unfortunately the seta formula given by Gurney (1927b) is incomplete, but the somewhat reduced exopod of the second antenna taken in conjunction with the appearance of the fifth legs suggests that it belongs in the *stromi* group of *Laophonte* sens. str.; Gurney suggests that it has affinities with *proxima*, which I have placed in the subgenus *Mesolaophonte*.

According to Monard (1928) *pilosa* Car (1884) has normal setation in its swimming legs; from the male third endopod it is probable that it belongs to *Laophonte* sens. str. (2.2.0. is the usual number of setae in the male when the female has 3.2.1.). The exopod of the second antenna is reduced, suggesting the *stromi* group, but Car's figure of the fifth leg does not enable any conclusion to be drawn.

In *pygmaea* the fifth leg is of the *stromi* type, the second antenna is stated to be like *brevicornis*, but is not described or figured for either.

Monard (1935a, p. 61) regards *sima* Gurney (1927b) as very close to *koreni* on the structure of the fifth leg. In my opinion it is much closer to *parvula* Sars, and both of these are very close to *inornata* A. Scott, in which case it also would belong to *Laophonte* sens. str.

The 1-segmented fourth endopod of *varians* suggests affinities with *L.* (*Metalaophonte*), but the description is too meagre for certain identification.

Van Douwe places his species *zimmeri* with *brevirostris*, *congenera* and *macera*, which would place it in *Laophonte* sens. str.

As stated above *rhodiaca* is known only from the male; while *mendax* cannot be placed until it has been more fully described.

The remaining species in the above list (marked with an (*)) are too indefinite for any conclusions to be drawn.

Of the species listed below I have not seen descriptions:

parvula (Claus) 1866; *uncinata* (Czerniavski) 1868; *nordlandica* Boeck 1872; *mississipensis* Herrick 1887; *bafanus* Labbé.

The name *parvula* was first used by Claus and the probability is that Sars' species of the same name will have to be renamed, but since I have not seen a description of Claus' species I have refrained from renaming Sars' species to avoid possible confusion.

As stated above I have been quite unable to trace Labbé's species *bafanus* quoted by Monard (1935, p. 66).

KEY TO LAOPHONTE MALES.

1.	3rd endopod 1-segmented	*trilobata* Willey 1929.
	3rd endopod 2-segmented	2.
	3rd endopod 3-segmented, 2nd segment without spine	*bengalensis* Sewell 1934.
	3rd endopod 3-segmented, 2nd segment with spine	16.
2.	End segment of 3rd endopod of normal shape, bearing setae only	3.
	End segment of 3rd endopod of normal shape, bearing spine on outer margin	6.
	End segment of 3rd endopod with outer distal corner produced into spine-like process	11.
3.	Basal segment of 3rd endopod without seta	4.
	Basal segment of 3rd endopod with inner seta	*varians* Brady 1910 (11).
4.	2nd endopod with 2 inner setae, one of them thickened basally	*perplexa* T. Scott 1899.
	2nd endopod with 1 unmodified inner seta	5.
5.	3rd and 4th endopods with 6 and 4 setae respectively	*capillata* Wilson 1932.
	3rd and 4th endopods each with 3 setae	*talipes* Wilson 1932.
6.	4th endopod 1-segmented	7.
	4th endopod 2-segmented	8.
7.	End segment of 5th leg well developed	*proxima* Sars 1908.
	End segment of 5th leg fused with basal	*curvata* Van Douwe 1929.
8.	Basal segment of 3rd endopod with inner seta	*subsalsa* Brady 1902.
	Basal segment of 3rd endopod without seta	9.
9.	End segment of 5th leg well developed	*typhlops* Sars 1908.
	End segment of 5th leg fused with basal	10.
10.	4th endopod with inner setae on 2nd and 3rd segments	*manifera* Wilson 1932.
	4th endopod without inner setae	*laurentica* sp. nov.
11.	End segment of 5th legs well developed, rectangular	*koreni* Boeck 1872.
	End segment of 5th legs fused with basal	12.
12.	2nd endopod with modified inner seta	13.
	2nd endopod with inner setae normal	14.
13.	1st inner seta of 2nd endopod swollen basally	*pilosa* Car 1884.
	1st inner seta of 2nd endopod a curved spine	*pauciseta* Lang 1936e.
	1st inner seta of 2nd endopod a curved spine, hooked distally	*stromi* (Baird) 1850.
14.	2nd endopod with 2 inner and 2 terminal setae	*minuta* Boeck 1872.
	2nd endopod with 1 inner and 2 terminal setae	15.
15.	2nd endopod no longer than 1st segment of exopod	*quinquespinosa* Sewell 1924.
	2nd endopod almost equal to 1st two segments of exopod	*sigmoides* Willey 1931.
16.	4th endopod 1-segmented	*littoralis* T. and A. Scott 1893a.
	4th endopod 2-segmented	17.
17.	Basal segment of 3rd endopod with seta	18.
	Basal segment of 3rd endopod without seta	22.
18.	2nd segment of 3rd endopod with seta as well as spine	19.
	2nd segment of 3rd endopod with spine only	*spelaea* Chappuis 1938.
19.	Basal segment of 4th endopod with inner seta	20.
	Basal segment of 4th endopod without seta	*longiseta* Nicholls 1941.

(11) Fig. 7 (p. 525) Brady 1910 is assumed to represent the 3rd endopod of *varians*, since it does not resemble the 2nd (fig. 6) of which it is stated to be the enlargement; the illustration of the endopod of the 3rd leg (fig. 10) is so small that an enlargement might be expected, and both the 3rd leg and fig. 7 show setae on the basal segment, not shown in the 2nd leg (fig. 6).

20. End segment of 2nd endopod with 2 inner, 2 terminal and 1 outer setae; spine on 3rd endopod not extending beyond end of ramus .. .. *rhodiaca* Brian 1928.
End segment of 2nd endopod with 2 inner and 2 terminal setae; spine on 3rd endopod extending beyond end of ramus .. .. 21.

21. Spine on 3rd endopod long and straight .. .. *cornuta* Philippi 1840.
Spine on 3rd endopod truncate, with serrated end .. *hirsuta* Thompson and Scott 1903.

22. Spine on 3rd endopod not extending beyond end of ramus .. .. .. 23.
Spine on 3rd endopod extending beyond end of ramus .. .. .. 26.

23. 1st exopod 2-segmented .. .. 24.
1st exopod 3-segmented .. .. 25.

24. Spine on 3rd endopod straight, reaching end of ramus .. *similis* (Claus) 1866.
Spine on 3rd endopod S-shaped, not reaching end of ramus .. *nana* Sars 1908.

25. Caudal rami nearly twice as long as wide, little longer than anal segment.
curticauda Boeck 1864.
Caudal rami nearly 3 times as long as wide, twice as long as anal segment.
huntsmani Willey 1923.
Caudal rami 4 times as long as wide, 2½ times as long as anal segment *thoracica* Boeck 1864.
Caudal rami nearly 5 times as long as wide, 2½ times as long as anal segment.
longicaudata Boeck 1864.

26. 2nd segment of 3rd endopod with seta as well as spine .. .. .. 27.
2nd segment of 3rd endopod with spine only .. .. 28.

27. End segment of 5th leg small, subcircular, with 2 setae; end segment of 3rd endopod with 4 setae .. .. *mohammed* Bl. and Rich. 1891.
End segment of 5th leg elongate, rectangular, with 4 setae and 1 spine; end segment of 3rd endopod with 3 setae .. .. *serrata* (Claus) 1863.

28. 2nd endopod with 1 of inner setae modified .. .. 29.
2nd endopod with inner setae normal .. .. 39.

29. 1st seta of 2nd endopod a curved spine .. .. 30.
2nd seta of 2nd endopod thickened basally .. .. 31.

30. Distal segment of 5th leg fused with basal .. .. *discophora* Willey 1929.
Segments of 5th leg distinct .. .. .. *tenuispina* Lang 1934.

31. 1st antenna with well developed spur on 2nd segment .. .. .. 32.
1st antenna with little or no projection from 2nd segment .. .. .. 33.

32. Spur on 1st antenna at right angles to segment .. .. *meinerti* Brady 1899.
Spur on 1st antenna recurved .. .. .. *taurina* Monard 1928.

33. End segment of 3rd exopod with 5 appendages .. .. 34.
End segment of 3rd exopod with 6 appendages .. .. *tenera* Sars 1921.
End segment of 3rd exopod with 7 appendages .. .. 35.

34. 1st exopod 2-segmented .. .. *lunata* Willey 1931.
1st exopod 3-segmented .. .. *zimmeri* van Douwe 1929.

35. 1st exopod 2-segmented .. .. 36.
1st exopod 3-segmented .. .. 38.

36. End segment of 3rd endopod with 1 inner and 2 terminal setae .. *macera* Sars 1908.
End segment of 3rd endopod with 2 inner and 2 terminal setae .. .. .. 37.

37. End segment of 4th exopod with 1 inner seta; 1st exopod ⅓ of basal endopod.
karmensis Sars 1911.
End segment of 4th exopod with 3 inner setae; 1st exopod nearly ½ of basal endopod.
hyperborea Sars 1909a.

38. 2nd endopod with modified seta inserted near middle of segment *brevirostris* (Claus) 1863.
2nd endopod with modified seta inserted in proximal third of segment *congenera* Sars 1908.

39. End segment of 3rd endopod with 2 setae (1 inner, 1 terminal) .. *baltica* Klie 1929.
End segment of 3rd endopod with 3 setae (2 inner, 1 terminal) .. .. .. 40.
End segment of 3rd endopod with 4 setae (2 inner, 2 terminal) .. .. .. 41.

40. Caudal rami not more than half as long again as wide .. *nordgaardi* Sars 1908.
Caudal rami twice as long as wide .. .. .. *arenicola* sp. nov.

41. Body flattened dorso-ventrally .. .. .. *applanata* Sars 1909a.
Body cylindrical .. .. 42.

42. 1st antenna 6-segmented .. .. *depressa* T. Scott 1894a.
1st antenna 7-segmented .. .. 43.

43. End segment of 3rd exopod with 5 appendages; end segment of 5th leg fused with basal. *campbelliensis* Lang 1934.
End segment of 3rd exopod with 6 appendages; segments of 5th leg distinct. *exigua* Sars 1905a.
End segment of 3rd exopod with 7 appendages .. .. 44.

44. Spine on 3rd endopod quite straight .. .. *gracilipes* Brady 1910 (12).
Spine on 3rd endopod slightly curved, serrate .. .. *sporadiensis* Brian 1928.
Spine on 3rd endopod sharply curved .. .. *faroensis* T. Scott 1903a.

With the following exceptions the descriptions of the males were obtained either from the original description or from Sars 1911:

pilosa Car 1884 (Monard 1928); *mohammed* Blanch. and Rich. 1891 (Gurney 1932, Wilson 1932); *hirsuta* Th. and Sc. 1903 (Gurney 1927b); *proxima* Sars 1908 (Klie 1929); *curvata* van Douwe 1929 (Monard 1937).

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(12) For the purposes of this key the male of *gracilipes* Brady (1910) is assumed to have a 7-segmented 1st antenna like the female; Brady makes no statement on the subject.

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